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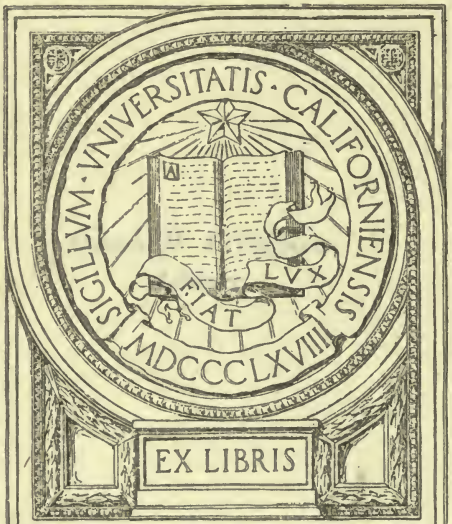

MODERN ITALIAN SURGERY

AND OLD UNIVERSITIES OF ITALY

UNIV. OF CALIFORNIA

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AND OLD UNIVERSITIES OF ITALY

BY

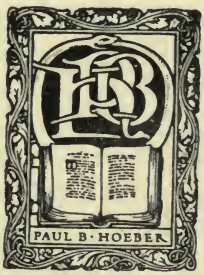
PAOLO DE VECCHI, M.D.

Corresponding Member of the Royal Academy of Medicine, Turin; Fellow American College of Surgeons

FOREWORD BY GEORGE D. STEWART, M.D.

President New York Academy of Medicine

WITH FIFTEEN FULL PAGE ILLUSTRATIONS



NEW YORK
PAUL B. HOEBER
MCMXXI

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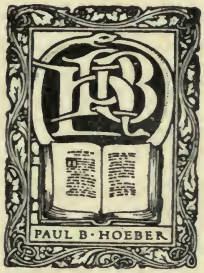

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DEDICATED
TO THE MEMORY OF
GIUSEPPE DE VECCHI, M.D.
MY BELOVED FATHER

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FOREWORD

For some years prior to the recent great war American medical students have gone to Germany for their post-graduate medical teaching: France, England and Austria, before this, having held the honor in turn. To Italy Americans have travelled to see art and ruins but never to visit the hospitals or to learn from Italy's medical teachers. Not that the world in general, or America in particular, was unaware of the reputation of the older Italian universities or unfamiliar with the skill and learning of the medical men of the Italy of modern times; but mankind, when the herd instinct is strongly developed, exhibits many reactions that may be traced to humble ancestry and one, at least, of the meek and lowly sheep, namely: that of crowding through the same hole in the fence or over the highest barrier that may block the way. And, then it must be admitted that the art and architecture of Italy, whether preserved or in ruins, present a strong appeal to persons of education and artistic taste.

The achievements of Italy in Medicine and Surgery during the last war, however, have been so great that the world can no longer fail to notice them. To mention one—the Surgery of the Chest—until Mikulicz and Sauerbruch undertook its study, the surgery of this region had not changed much from the time of Hippoc-

rates. During the war, however, French surgeons boldly invaded the pleural cavity, delivered the lung, if it was injured or bleeding, removed foreign bodies, replaced the lung and closed the cavity, recognizing, as did Hippocrates and Paré, the dangers of an open pleura and pleural fistulæ. So great was the success achieved by this method that one celebrated abdominal surgeon is reported to have said that after reviewing its results he was disposed to regard as wasted the time he had spent on studying organs below the diaphragm. So strong a statement is obviously the hyperbole of a sudden enthusiasm and not justified by the facts, but there can be no doubt that in Chest Surgery the procedure referred to, represented a long step forward. Almost at once, however, a much longer forward step was taken by an Italian surgeon, Eugenio Morelli, who put the lung at rest and controlled the bleeding by injecting air into the pleural cavity, a maneuver also suggested by an Italian doctor, Carlo Forlanini.

It is, of course, impossible to name here any considerable portion of the medical men of modern Italy who have added luster to their science, but it is in no sense invidious to refer to Edoardo Bassini of Padua and his original operation for the cure of inguinal hernia; Francesco Rizzoli and Alessandro Codivilla of Bologna for their work on orthopedics; Enrico Bottini of Pavia for his contribution to the surgery of the prostate gland; Edoardo Porro of Milan for his special

uterine operation; Antonio Carle of Turin and G. F. Novaro of Genoa for their contributions to the surgery of the intestines; Francesco Durante of Rome for his iodide treatment of bone tuberculosis; Raffaele Bastianelli, also of Rome, for his extensive contribution to the surgery of the thorax and abdomen; Davide Giordano for his study of the surgery of the kidneys; G. Vanghetti who devised experimentally kineplastic flaps for amputations, and Antonio Ceci of Pisa, who, applying these principles to the human subject, attained a much more satisfactory prosthesis than ever before achieved.

America has a large industrious and intelligent Italian population; New York City alone contains a larger Italian city than any to be found within the borders of the Kingdom of Italy itself. For economic, scientific and artistic reasons it is desirable to promote a better understanding between the two countries; particularly, is a closer affiliation between the medical professions of the two countries desirable. Medicine has always borne on its banners an inscription to the Brotherhood of Man and neither maps nor languages should interfere with its progress.

It is with the hope of promoting and fostering such an understanding that Dr. Paolo De Vecchi, an eminent and learned Italian, who studied at the University of Turin, and has spent his entire professional life in America, has written this volume. It is not a scientific

review by any means but a brief recital of what has been done by modern surgeons in the different universities of Italy in the last fifty years, and especially during the last war. To the surgeon who plans to visit Italy, the simple and clear statements contained herein will facilitate his introduction to the institutions, schools and hospitals, where he will be sure to find that proverbial courtesy and hospitality which characterizes his Italian colleagues.

Honored by the friendship of the author I have been privileged to read his book in manuscript, and I take great pleasure in recommending it to the friendly consideration of American physicians.

GEORGE D. STEWART.

NEW YORK,
August, 1921.

PREFACE

In August, 1914, at the beginning of the gigantic war which kept the entire world in such terrible anxiety during four years of misery and devastation, I published a booklet under the modest title of "Note ed osservazioni sulla Chirurgia e sui Chirurgi degli Stati Uniti d'America." The booklet was written for the benefit of the young Italian fresh from a medical school and lacking post-graduate surgical training, who induced by dreams of adventures planned to emigrate to the United States with the mirage of a professional success based only upon great illusions and little experience.

That brief work, quite inadequate to the subject, was written only for the purpose of saving some young adventurous colleagues from disastrous failure, due principally to their complete ignorance of the real standing of American surgery, and of the enormous progress made by American surgeons in the last score of years.

This lack of knowledge among Italians, with few exceptions, of the real status of medicine and surgery in the United States, was fully reciprocated by a similar ignorance among Americans of the great progress made in Italy in every branch of the scientific field, especially in surgery, during the last fifty years.

The reason for this mutual ignorance was obvious. In Europe, the American dollar has been considered the standard of the progress and prosperity of America, and

people over there could hardly believe that an American had time for anything but the accumulation of wealth.

The same erroneous idea has been prevalent among Americans, who, in the past, have travelled in Italy for the mere solace and enjoyment of the balmy climate and beautiful scenery. Only a few scholars have devoted their time to antiquities and to art. Perhaps it might be said, in extenuation of the above assertion, that some of these scholars have also devoted their studies to modern Italy; but their attention has been generally confined to the political and social phases of the new nation.

Italy's great struggle for the achievement of her independence absorbed most of her moral, intellectual and financial resources during a good portion of the last century, and the Government, pressed by urgent needs, had to neglect the new and complex educational system. Nevertheless, the individual efforts of her citizens, who deeply felt the national pride and the stimulus of race tradition, proudly kept the sacred fire of scientific study alive, until the storm of agitations, unavoidable in the building of a new nation divided for centuries under foreign rulers, began to subside. The return of peace gave to the collective force of the country a chance of reviving and reorganizing her scientific studies; again, time and money were devoted to the national universities which had been, for other urgent necessities, somewhat neglected.

With a great deal of pride, the young nation can now look upon the gratifying result of her efforts in rebuilding, from the chaos of antiquated systems, an almost entirely new and uniform standard of schools

and institutions, equipped with modern laboratories which fully meet the necessities of the present scientific requirements.

When we consider the tremendous financial strain Italy has gone through during seventy years of struggles and wars, we cannot help wondering how she could accomplish so much. At the same time we cannot help admiring the men who have nobly sacrificed their time, comfort, and wealth for the love of their country, and for the advancement of science.

A brief account of modern Italian surgery, and of the men who have distinguished themselves in this field is presented especially for the purpose of bringing together the physicians and surgeons of Italy and America. This, it is hoped, will bind more closely international relations, based not merely on a misunderstood value of financial power on the one side, and past history on the other, but on the mutual advantages resulting from the exchange of ideas and of studies, and also on the broad conviction that science is not a heritage of any country and that culture cannot be a privileged gift of any one individual (much less an aristocratic inheritance of any particular nation) but is and will always be the democratic patrimony of the whole world.

In presenting this little work to my colleagues in the United States, I feel that I should apologize to those in my native country for a book which is absolutely inadequate to the importance of the subject. My only justification is my purpose—that of trying to familiarize American surgeons with the Italian school of surgery, in the hope that they will visit Italy, not only as a

pleasure resort, or a center of antiquities, but as a new country and a new seat of education. I am convinced that the knowledge of one branch of medical research may bring about the desire for further study in the many branches of modern science, in which Italy has shown herself so highly proficient, with the inestimable result of mutual benefit to both nations.

I could not deal with the remarkable progress made by Italian surgeons without mentioning the Italian universities with which the school of surgery is always connected. To deal with such a vast subject as the history of the universities of Italy would mean a most extensive work, which is not the purpose here. However, it will certainly be interesting to the American reader to know something about the origin and the workings of such institutions, and about the cities and surroundings which may attract the professional man as tourist, combining "*utile dulci*," and this account may induce him to visit the universities and familiarize himself with the surgical school of each one.

P. De V.

New York,
July, 1921.

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UNIV. OF CALIFORNIA

Chapter I

MODERN ITALY

WE all know something of Italy, her ancient history, her connection with the Roman Empire, and perhaps most of us know, from school, her geographical location, while some of us are familiar with the principal haunts, .rtists

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The fall of the Roman Empire left Italy exposed for centuries to the invasions, depredations and devastations of the barbarians of the east, of the north, of the south, and from over the sea. Goths, Ostrogoths, Vandals, Huns and Saracens, attracted by the beauty and the wealth of the country, pillaged everything which could be useful to them, destroying the rest for the inborn lust of destruction.

UNIV. OF CALIFORNIA

Chapter I

MODERN ITALY

WE all know something of Italy, her ancient history, her connection with the Roman Empire, and perhaps most of us know, from school, her geographical location, while some of us are familiar with the principal haunts, which for years have been the joy of tourists, artists and poets looking for pleasure and inspiration.

But few of us know the history of modern Italy, of this new nation, only a little over half a century old, born from the chaos of the Middle Ages, and freed from the dismemberment and oppression of many foreign usurpers after a long struggle amid almost insuperable difficulties.

No true and impartial history of this young nation has yet been written, the warm partisan feeling of most of the men who took part in the building of the new country being responsible for this.

The fall of the Roman Empire left Italy exposed for centuries to the invasions, depredations and devastations of the barbarians of the east, of the north, of the south, and from over the sea. Goths, Ostrogoths, Vandals, Huns and Saracens, attracted by the beauty and the wealth of the country, pillaged everything which could be useful to them, destroying the rest for the inborn lust of destruction.

Later on, Italy became a coveted prey of the French or German rulers, who, for centuries, disputed the possession of her fertile land, which was often the field of terrible battles, until sparks of national pride gave origin to the Lombard Communes, the republics of Venice, of Genoa, of Pisa, of Florence; the duchies of Milan, of Savoy; the small kingdoms of Naples-Sicily, of Sardinia, and later the duchy of Tuscany—all striving in a continual fight and dispute for local or seminational supremacy.

To Dante Alighieri, the great national poet of Italy, belongs the glory of being the first exponent of a national unity, and his ideas for centuries were the dream of most of the intellectual people of the country, until the sparks of the French Revolution, which spread all over Europe, were conveyed to Italy by Napoleon, the ambitious Corsican, who planned, in his restless mind, a crown for his family.

The fall of Napoleon did not extinguish the sacred fire of liberty. The idea already inflamed the minds of the best intellects of the country, who had already worked together in harmony for one purpose, "To free their people from foreign dominations." It was that patriotic understanding among the most intellectual men throughout Italy, elated by the writings of Carlo Cattaneo, Giuseppe Mazzini, Vincenzo Gioberti, Ruggiero Settimo, and hundreds of others, which established the sentiment of unification among the masses, against the rabid rulers, who were trying to retain possession of their trembling crowns.

During the last century the Italians, north, south, east and west, fought hard for their freedom from

foreign tyranny and domination against which they had risen on several occasions unsuccessfully.

The Neapolitan provinces and the island of Sicily were under the rule of the Bourbons, which Gladstone had called "The Negation of God." The Central States were under the spiritual and temporal power of the Pope. Venice with Lombardy, the northeastern part of Italy, was under the heel of the Austrian reigning house of Hapsburg, whose relatives were holding the duchies of Tuscany, Parma, Piacenza and Lucca.

The house of Savoy ruled over Piedmont, the little kingdom in the northwest of Italy, which soon became the asylum of all the political refugees. In Turin, the capital of the little kingdom, these refugees, exiled from the oppressed provinces, found sympathy, encouragement and shelter; together they worked and conspired for the liberation of their country from tyrannical servitude and for a future united Italy, the common mutual aspiration of the majority of the inhabitants of the country.

The liberal constitution, framed and given to the people of Piedmont by its king, Carlo Alberto, in the year 1848, bound together all the liberal leaders of the rest of Italy. They rushed to the colors under one flag of three symbolic colors—green, white and red—which ever since has been the flag of New Italy. From that year started the gigantic fight between the little kingdom of Piedmont and the mighty, powerful double empire of Austria-Hungary, the David and Goliath struggle of modern times.

It would be too long here to recount the many epical deeds of the new nation, the audacious insurrection of

Milan, the short-lived republic of Rome and its dramatic defence against the French Army, the Revolutions of Naples, of Palermo, the long and glorious defence of Venice, and the campaign of Lombardy which ended disastrously at the battle of Novara. The die was cast, and the destiny of Italy was in the hands of her valiant men, determined to win or die.

The participation of Piedmont, as an ally of England and France in the Crimean campaign against Russia, was a skillful diplomatic triumph of Camillo Benso di Cavour, the great Italian premier, who won, then, the moral support of England and the material help of France in the following campaign of 1859 against Austria. The campaign ended with the victory of Solferino and San Martino and the liberation of Lombardy.

The following year a daring expedition led by Giuseppe Garibaldi with one thousand volunteers landed in Sicily, starting a revolution which rapidly spread through the kingdom of Naples, and, after several brilliant combats, ended at the battle of Volturno the domination of the Bourbons, annexing the Neapolitan and Sicilian provinces to the new kingdom of Italy.

But the unification of Italy was rapidly approaching realization. Only a few years after, in 1866, the war between Prussia and Austria, which ended so disastrously for the double empire at the battle of Sadowa, gave Italy the opportunity of attacking Austria and of winning the Venetian provinces. Again, a few years later, the fall of Napoleon III, at the battle of Sedan, deprived the Vatican of a military support

for the temporal power, and soon after (September 20, 1870) the Italian troops occupied Rome, which, by a popular vote, was declared the capital of Italy.

To complete the dream of Dante, the much coveted aspiration of the Italian people, there remained only two provinces, Trent and Trieste, which were yet under the yoke of Austria-Hungary.

Notwithstanding the intense unanimous desire of the Italians for the possession of those two provinces, not only for sentimental reasons but for political, strategical and commercial purposes, the difficulty of the enterprise, from a military and naval point of view, was so great that the majority of the people hesitated, when, here again, the good star of Italy came to her help.

A little digression is necessary to understand the exact political situation of Italy at the time the war started in 1914.

Since her defeat of 1870–71, the unwise policy of France, jealous of Italy's rapid aggrandizement as a commercial rival, brought the country unwillingly into an alliance with Germany and Austria-Hungary, which, notwithstanding its simply defensive character, yet was looked upon with unpopular feeling throughout the peninsula because of the natural antipathy and dislike of a German commercial invasion.

When Austria declared war upon Serbia, Italy, in consequence of her antipathy, at once joyfully took the opportunity of severing her pact of defensive alliance with Germany and Austria-Hungary. Italy was at that time financially somewhat depleted because of the two years of war in Libya; yet the old spirit of the nation

met the situation with courage and determination, denouncing freely the Austro-Hungarian attack on Serbia as an arrogant, unjustifiable act of abuse of force.

France was at once notified of Italy's determination to keep absolutely neutral, assuring her that she had nothing to fear along her borders, thus giving her the chance of withdrawing half a million of troops just in time to press them on the Marne, to save Paris from capture.

Never had the Italian Government been in such a critical condition before, with most of the army still engaged in the desert of Africa. Those were anxious moments for all; moments of incertitude and hesitation which gave to the conservative party a grave responsibility. A shrewd German diplomat, von Buelow, tried to take advantage of the delay for the purpose of gaining time, which was very precious for the Austro-Hungarian army, then engaged on the Russian front.

But the young national party succeeded in stirring up the popular feeling, and enthusiasm had no bounds when the well-known poet and dramatist, Gabriele D'Annunzio, in an inspired speech delivered from the Rock of Quarto, while celebrating the anniversary of the expedition of Garibaldi to Sicily, denounced the hesitation of the Government as treachery and cowardice, and called upon the people of Italy to fight for the honor, for the liberty of the mother country, for the civilization and humanity of the world.

The conservative party resigned, pressed by the excited crowd clamoring for war, and the King had to summon a set of more aggressive men who would assume the responsibility of carrying through the

wishes of the people, unmindful of the tremendous task of raising the great amount of money needed for a large, strong army, well equipped and properly fitted for the gigantic task of attacking a powerful army entrenched in fortifications built after fifty years of skillful and patient work, upon mountains considered impregnable by the best experts in military affairs.

But, following the day of the declaration of war, everyone, from the King to the last citizen, understood that it was a fight to a finish, a fight for life or death, and everyone gave generously everything for the accomplishment of the great purpose.

The hardships which Italy suffered during the three years of the terrible war are only known to those who travelled through the country and visited the front during that time. It was beyond description; but it has proved to the world that the Italians are a united nation, not only as a race, but in character, in sentiment, in thought and in purpose. They went into that war with the firm purpose and conscience of fighting for their sacred rights, of making their country free from foreign domination and oppression, free from future danger of aggression and abuses.

It was a formidable undertaking and a gigantic work for a new army, continually exposed to hardships which were unknown at the other fronts, fighting against mountains above the clouds, at 10,000 feet above the sea level, entrenched in perpetual snow and ice, threatened by deadly avalanches that entombed many victims, buried in those crevasses from which even the bodies could not be rescued. Thousands, victims of frost-bite requiring amputations, were lost to the force,

and a great many, exposed to the inclemency of the weather and the suffering of the trenches, lost their health forever. But the majority of the "Alpini" (a select army corps), hardened by the strenuous life, elated by the mirage of the final success of the Italian cause, kept the enemy at bay, surprising him with a tremendous activity, building magnificient roads—marvels of engineering—overcoming the difficulty of carrying provisions and supplies over the mountains by erecting aerial railways on which to bring guns, ammunitions, food, water, and returning the wounded soldiers to be cared for in the hospitals.

The famous quick-stepping "Bersaglieri" helped the Alpini in their counter-attacks, and another selected body of troops, the "Arditi," rushed to death by advancing to cut the wire fences and clear the way for the advancing troops.

The work of the engineering corps was marvellous throughout the entire campaign, building stupendous roads, tunnelling mountains, throwing bridges over the Isonzo River; under tremendous artillery fire from the enemy, setting up barracks and hospitals which were models of shelter under such arduous conditions.

The disaster of Caporetto, which at first was considered fatal because an entire army corps had been surprised and compelled to surrender or disperse, proved instead an incentive to a patriotic revival throughout all Italy. The entire population realized the danger of a propaganda which had been working among the soldiers in the trenches and among the families at home, depressing the spirit of the poor people after their long suffering.

It was the inspired, popular resistance of the brave soldiers that nerved them unanimously to select the Piave River as the line where they could make the stubborn and deadly stand which they did. One year of anxiety, amid the hurried preparations for an attack, ended with the most brilliant victory of the campaign after seven days of one of the bloodiest battles in the history of war.

On November 3, the Austro-Hungarian army, completely defeated at Vittorio, demanded an armistice, surrendering without conditions. One million prisoners, 8,000 cannons, 250,000 horses fell into the hands of the victorious army of Italy, beside the enormous provisions which the enemy had no time to destroy.

The fall of the Austro-Hungarian Empire, a surprise to the world, hastened the collapse, on the Western Front, of the German army, which, only eight days after, begged for an unconditional armistice.

Italy's great victory at the battle of Vittorio-Veneto, on the River Piave, placed her among the great nations of Europe. Accordingly she was called to take her place as the fourth great nation to discuss peace terms and international interests for a possible future peace.

The war had cost her 500,000 soldiers killed, 300,000 dead of diseases contracted in war, 800,000 wounded, 400,000 crippled for life, and twelve billions of dollars of national debt, which amounts to almost two-thirds of her entire national wealth.

But Italy has the enormous reserve of human labor; 80 per cent of her people are laborers, sober, persistent, skillful and, above all, economical. With that capital

at hand she will face, serene, the hardships of her financial obligations, especially now that her troubles are over.

The struggle of seventy years of agitations and wars, the necessity of looking for help, the unfortunate alliance she was compelled to accept, have taught her people to trust only in themselves, to rely on their own capacities, to depend principally on their national unity, which means strength, power, ability in developing their own resources to the full capacity.

Recent events have shown how much Italy has appreciated the noble help that America has given her in her moments of distress and intense suffering, and the people of Italy will never forget what America has done for humanity, for civilization, for that liberty which is so dear to Americans, and for which they sacrificed so much in this last struggle for international independence.

Modern Italy is a democratic nation, whose King has been described by Theodore Roosevelt, in his letter to George Trevelyan, as the most liberal ruler he met in his trip through Europe in 1911.

Victor Emanuel III has been the faithful guardian of the constitution framed by the patriots of 1848, and sworn to by his great grandfather Carlo Alberto, king of Piedmont and Sardinia, the little state which, headed by the house of Savoy, started the redemption and unification of Italy.

The name of Mazzini, the name of Cavour, the name of Garibaldi cannot be separated from that of Victor Emanuel II, the grandfather of the present king. The history of modern Italy cannot be written without men-

tion of all these factors of her independence, of her liberation, without praise of that great army which brought gloriously to a close the great drama of her final unification, and at the head of which stood calm, serene, confident, in the midst of the great storm, the noble figure of Victor Emanuel III.

Chapter II

THE AMERICAN RED CROSS IN ITALY

WHAT the American Red Cross has done to alleviate the horrors of the war can hardly be written; it is beyond description. But the gratitude of the world will remain as a testimonial to the great, generous and incomparable work which was carried on, on every field, with undaunted sacrifice by men and women devoted to the noblest cause of humanity.

Among the numerous commissions sent over by the Red Cross from Washington, one left for Italy, July 28, 1917, to investigate and study the needs of that country. Two distinguished medical men accompanied that commission, Dr. Thomas W. Huntington, emeritus professor of surgery, University of California, and Dr. Victor G. Heiser of the Rockefeller Foundation, who had been professor of hygiene, Philippine University. Both, with friendly courtesy, authorized me to insert in this work an account of their experience, which is rather flattering for the Army Medical Organization in Italy.

San Francisco, Calif.,
August 23, 1918.

My Dear Dr. De Vecchi:

In response to your request, permit me to contribute this note which I place at your disposal.

With the American Red Cross Commission to Italy, we crossed the line between France and Italy early in September, 1917.

There was assigned to me the very pleasant task of inspecting hospitals of all types of the Italian army, and the Italian Red Cross, and a large number of wounded who were being cared for in said institutions.

From the moment of our advent upon Italian soil we were deeply impressed by the devotion, the efficiency and the brilliant achievement of Italian surgeons.

Fairly familiar with the literature of Continental Europe and England, I frankly confess that my knowledge of Italian surgery and surgeons was deplorably deficient. As we progressed through Genoa, Rome, throughout the northern front on the Isonzo River, through Milan, Florence, Venice and in southern Italy to Palermo, a revelation was awaiting us at every point. The number of wounded was appalling.

The tragedies of civil life have ever been individual, in the singular or by the score. The tragic incidents of warfare as seen in the military hospitals are by the hundreds, thousands, and ten thousands.

Hospital organizations everywhere showed a development and a completeness that will form an interesting chapter in the history of the present war. Chiefs of departments were chosen wisely from a coterie of surgeons, alert, brilliant, highly trained, and in every sense masters in their profession. To me it was delightful to note the absolute forgetfulness of self as shown by men high in rank, whose duties were manifold. Not infrequently men of this type were found diligently at work in their several stations from early morning till late at night. During the active periods when the ingress of wounded was overwhelming, chiefs and their staffs not infrequently remained on duty twenty-four, thirty-six, and forty-eight hours, with brief intervals of rest. The reflex of this spirit was shown in the status of the wounded, and in the discipline of the junior officers.

The problem of sepsis and of ordinary and special infection were met by a clearness of perception and full appreciation of scientific development.

At Milan it was my good fortune to spend an hour in conference with Professor Tizzoni of Bologna, who is one of the world authorities in the investigation and treatment of tetanus. Professor Tizzoni was one of the first, if not the first, to administer dosages of antitetanus serum. This he had worked out in his own laboratory, and has given to the Italian army the great benefit of his research.

Nowhere is the artistic spirit of the Italian shown more forcefully than in the plastic work which is being done in the Italian hospitals in the interest of face and jaw wound. Long series of ghastly mutilations of this type were shown us in the ward and by photograph in many hospitals where this class of work has been highly specialized. It is interesting to note that several of the most brilliant and artistic operators in this field were educated in American dental schools.[1] This manifestly was supplemented by the inspiration of Italian art.

The treatment of wounds by the Carrel-Dakin method has been developed splendidly in nearly all the hospitals in Italy. Wherever the apparatus for this procedure was available, it was in use. In one hospital unit I found 2,100 cases of open fractures, all, or nearly all, treated by the Carrel method. The temperature chart reflected in a graphic way the result of the surgeon's efforts. The old see-saw chart, denoting protracted and deep infection, was not to be found in the entire establishment.

The casualty dressing stations were uniformly located in or contiguous to the first line trenches. Evacuation or Field Hospitals were placed as near as safety permitted to the casualty dressing stations, thereby insuring prompt relief to the gravely wounded.

Looking back upon my experience and observation in the hospitals of this splendid country, I find little to suggest as a revision and much to elicit admiration and commendation.

Very truly yours,

THOMAS W. HUNTINGTON,

Late member of the American Red Cross Commission in Italy.

[1] Dr. Albert Webb, a successful American dental surgeon practising in Rome, distinguished himself at the front as a captain in the Italian Sanitary Corps.

In addition to the illuminating letter of Dr. Thomas W. Huntington, the lecture read before the College of Physicians of Philadelphia, January 2, 1918, by Dr. Victor G. Heiser of the Rockefeller Foundation has points which should command the closest attention on the part of the reader.

Some of the Accomplishments of Italian Medical Men in the War[1]

Victor G. Heiser, M. D.
Member, American Red Cross Commission in Italy

It is generally understood that the Italian army at the present time consists of at least 4,000,000 men, and that the number of hospital beds is approximately 1,000,000.

Just what it means in two years to expand a country's hospital service to these huge proportions can be better appreciated when it is recalled that in the entire United States, with a population almost three times as great as that of Italy, there are only 300,000 beds. Yet in spite of this vast achievement, the work accomplished by the Italian medical profession since the beginning of the war has attracted to itself but little attention in this country.

The reason for this is obvious. While probably none of the Allies who are fighting in Europe has received less aid other than financial help from outside their own borders, the medical men of Italy almost invariably were loath to speak of their achievements. There was no boasting anywhere.

It is characteristic of the Italian Medical Service to achieve results and then, perhaps, talk about them. Nowhere did we hear of what the medical service was going to do. It was only the thing they had done of which they could be induced to speak.

The equipment necessary for preventing disease and for the care of the sick and wounded has been provided almost entirely in Italy. In many instances establishments for the production of hospital and medical supplies did not exist at the outbreak of the war, and had to be created. Large institutions for the re-education of the injured, which will compare favorably with the best, are

[1] *J. Am. M. Ass.*, Jan. 5, 1918, lxx, 24–27.

in full operation. Hospitals rendering excellent service exist near the front-line trenches. New types of hospital construction have been evolved. Mobile hospitals of 100-bed capacity, which can be taken down and transferred 75 miles and set up and put in service again within twenty-four hours, are in use; the entire equipment, including the hospital furniture, instruments, operating room appliances, and roentgen-ray plant, is transported on five camions (motor trucks) and three touring cars. New operations, particularly in dental surgery and lung surgery, new instruments and devices without number, have been developed. The following statement, although very incomplete, may convey some idea of what had been accomplished by the Italian medical profession up to October 1, 1917.

ORGANIZATION

The Italian Medical Service is presided over by an official who has his office with the Minister of War at Rome. The service, however, is not so highly centralized as is the case in this country. There is a chief medical officer, common to all the armies, who has his headquarters near the front, at a point which is the principal center for the storage and distribution of supplies, not only for the medical department, but also for the entire army.

Representatives of the Quartermaster's and Commissary Departments of the Signal Corps, Ammunition Department, Red Cross, and other branches of the army are located there. They dine together in a common mess hall and have ample opportunities for cooperation. Under the chief medical officer, there is stationed with each army a principal medical officer who has almost determining powers in directing medical work pertaining to the army with which he is stationed.

The care of the wounded at the front, as well as throughout Italy, is undertaken jointly by the Italian Red Cross and "Sanita-Militare" or army medical service, medical aid being rendered through the following seven classes of agencies, which cooperate in passing back the wounded with a remarkable degree of efficiency, and may be considered in the order of their relative distance from the front line trenches.

1. The "Posti di Medicazione." These are the most advanced dressing stations for emergency services, and are located usually in dug-outs in trenches very close to the front.

2. The "Sezione Sanita." From 1 to 2 kilometers behind the front, usually at a point which can be reached by an ambulance, are the "Sezioni di Sanita" or dispensaries. They are more fully equipped than the preceding.

3. "Ambulanze di Montagna." These are located from 2 to 5 kilometers behind the front, and are the most advanced point reached by the Italian Red Cross.

4. "Stazioni di Sanita." These are somewhat larger and better equipped than the preceding. Tetanus antitoxin is usually given here.

5. "Ospedali da Campo" or Field Hospital. These hospitals are located in convenient and accessible points somewhat farther back. At the outset of the war they were of 50-bed capacity, but experience soon showed that it was frequently necessary that they be of 500-bed capacity. They are now also used as Smistamento, or distributing centers, at which patients are classified and sent to the various special hospitals.

6. "Ospedali di Tappa." These are base hospitals, and may be located several hundred kilometers behind the lines. They are usually grouped, so that in one village or town or area there may be a bed capacity varying from 20,000 to 40,000.

7. "Ospedali di Riserva." These hospitals are institutions or other large buildings located throughout the cities of Italy which have been made available for the reception of soldiers.

The whole question of handling the wounded is still in a transitional state. Many hospitals, however, have been actually brought near the front-line trenches.

For each army there are a number of large quarantine or disinfecting stations, equipped for the treatment and detention of soldiers that have come from areas in which dangerous communicable diseases have prevailed, as for instance, cholera, malaria, dysentery and typhoid. These stations are provided with steam disinfecting apparatus or sulphur dioxide chambers, or other means for disinfecting clothing and equipment.

Special effort is made to sterilize textiles which have become infected, and particularly those which may have become infected with body-lice or their eggs. Every patient, before being admitted to one of the general hospitals, is detained at a quarantine station for a sufficient time to permit several microscopic examinations of the stool.

All prisoners, likewise, are passed through stations of this kind.

HOSPITALS

Construction. The hospital accommodation afforded by the Italian Red Cross consists largely of converted tourist hotels, schools and other large buildings which could be adapted to the purpose.

The hospitals provided by the medical service of the army consist of existing army hospitals, many of which have been expanded, converted military buildings, or entirely new buildings erected for hospital purposes. The latter are usually one-story pavilions about 14 feet high, 18 feet wide, and of any desired length, constructed of angle iron placed on 6-foot centers, with the intervening space filled in with hollow tile. The tile resembles that used in fireproof construction in this country. The roofs also are of tile. Building of this type can be rapidly constructed, and hundreds of beds can be provided in a week or two. Over the course of a year or more, they are much cheaper than tentage. They are cool in summer and can be kept warm in winter. It is noteworthy that one seldom sees patients cared for in tents in Italy.

The decreased use of cavalry in this war has made available large numbers of cavalry barracks. These, when renovated, lend themselves to hospital purposes. At Udine, for instance, one of the cavalry barracks has been made into a single hospital ward with 300 beds. The proportions of this ward are immense. From one end of the room it is almost impossible to see a bed located at the other.

Hospital Locations. Hospitals have been located nearer and nearer the front, as it has been deemed advisable to risk the occasional danger from shells, in view of the great advantage in having immediate treatment available for the injured. One finds

these hospitals in most unusual positions. It was a novel experience to be taken 30 or 40 feet underground, and there at a point directly over which a battle was raging, to see the regular hospital routine going on in good operating rooms and wards supplied with artificial ventilation and modern hospital furniture, and, in general, admirably adapted to the purpose.

To go to the other extreme, at an elevation of 6,000 feet in the Dolomites, we came on a hospital of 30-bed capacity hewn out of the side of a cliff. The two side and back walls were of stone, and the mountain range at this point was so narrow that through a hole bored in the back wall of the hospital it was possible to look into the Austrian trenches on the other side of the mountain. This hospital may be said to be on the front-line trenches. The wounded that were able to travel after receiving emergency treatment were sent to the rail head on the marvellous teleferica, which often go from mountain top to mountain top over chasms thousands of feet deep.

Hospital Specialization. Specializing has been carried to a high degree. For instance, at Udine, we saw 1,500 fracture patients in a single hospital. At other hospitals we saw under treatment only patients with gunshot wounds of the chest. One hospital had 70,000 admissions during the month of August, which corresponded to a period of active offensive operations. Some of the hospitals are so large that a motor car is required to visit the various buildings.

Great progress has been made in developing the technique. We were told for instance, that at the hospital in charge of Dr. Bastianelli, Professor Morelli had invented an improved aspirator for draining fluid from the chest. Pressure within and without the lungs can accurately be read on a gage, and through the development of special technique, which among other things permits the lungs to remain collapsed during definite periods, he has been able to produce some startling results in connection with lung surgery. Professor Morelli informed us that he had recently completed 100 cases without mortality. He believes it to be entirely feasible to keep the mortality well under 5 per cent, in all gunshot wounds of the chest.

Roentgen-ray Apparatus. At the time Italy went to war few factories existed for the production of hospital and medical supplies. There was, for instance, scarcely a roentgen-ray apparatus in the country that had not been made in Germany. At present, practically every hospital throughout Italy has one or more roentgen-ray machines, all manufactured in Italy. Not only is the apparatus as good as that formerly imported, but many competent observers believe it to be far superior.

Ambulance Service. A remarkably efficient ambulance service has been established. With the exception of a few cars furnished through the British Red Cross, all the ambulances have been supplied by the Italian Red Cross or the Italian Government. Owing to the mountainous character of the service required, heavier cars have been found to be most practical. During active engagement the empty ambulances going to the front carry many additional stretchers. These are filled and placed in the empty camions that have taken ammunitions or other supplies to the front. Since a modern war is largely a problem of transportation, this reduces the number of vehicles, prevents congestion of the roads, and affords prompt service for returning the wounded from the most advanced points at the front.

Hospital Trains. The smooth organization of the hospital train service was one of the most striking features that we saw in Italy. Both the Italian Red Cross and the Army Medical Service provide such trains. There is indeed considerable rivalry between these two organizations as to which can furnish the most prompt and efficient evacuation.

In a number of instances we saw a train back into a side track next to a hospital, take on board 350 wounded, and in less than thirty minutes proceed on its way. There was no confusion, and everything seemed to work with clock-like precision.

NEW INVENTIONS

One is particularly impressed by the large amount of new apparatus that has been invented. Formerly, Zander or similar apparatus mostly came from Germany. Not only are all these now manufactured in Italy, but a large number of new machines have been

invented to meet the needs of war cripples. We saw an ingenious pneumatic tourniquet, new apparatus for jaw surgery, improvements in artificial limbs, and many other things too numerous to mention.

Re-education Institutions. The Rizzoli Institute in Bologna, created many years before the war, had considerable distinction for its prosthetic appliances and method of re-education for lost functions.

Almost unbelievable progress in these directions has been made. The Regina Margherita Hospital, or Institute for Physical Re-education in Rome, will compare favorably with the best of similar institutions anywhere. This institution has a capacity of 1,200 patients. Of these, 700 are in the physical therapy division. About 600 patients are discharged per month. Some of the passive exercise machines that have been developed are very ingenious. Great stress is laid on specialized forms of physical drill for rehabilitating nerve function.

We were shown some very truly remarkable results in this direction. The Villa Mirafiore, which belongs to the American Academy in Rome, has been set aside as an institute for mutilated soldiers. It is directed by Dr. Guali, who has devised most excellent improvements in artificial limbs. It is said that at the outset of the war practically all the limbs had to be purchased in America, but now almost all are manufactured in Italy at a great saving in cost. Dr. Guali has invented, likewise, an ingenious apparatus for registering the pressure of the artificial foot. This apparatus enables him so to modify the limb construction as to bring the pressure to bear similar to that of the human foot. Certainly, some of his results were most striking. At the Rizzoli Institute in Bologna, we saw a soldier who had been blinded in both eyes and had lost both hands, yet who, by the use of an apparatus devised especially for him, was able to use a knife, fork and spoon.

At other institutions, after the lost function had been partially restored, a trade suitable to the condition of the individual patient is taught. Typewriting, printing, wood carving, lathe work, tinsmithing, basketmaking, and even primary education, are taught at these various places.

QUARANTINE STATIONS

In addition to the quarantine stations heretofore mentioned as being located in northern Italy directly in connection with the various hospitals at the front, there are in southern Italy huge quarantine stations which for size will probably long hold world records.

Equipment for steam and sulphur fumigations, as well as detention barracks, have been provided. For instance, the French, in order to take care of the soldiers returning from Saloniki and eastern fronts, have in southern Italy built a quarantine station for 40,000 persons.

The British constructed a station for 20,000 soldiers for the same purpose. At these stations careful examinations are made for cholera, typhoid and dysentery carriers. Blood examinations are also made in order to detect malaria. Soldiers found infected are treated before being allowed to return to Great Britain or France. Italy has established huge stations for the return of her soldiers from Saloniki and Albania. When it is stated that over 100,000 malaria patients have been invalided back, the importance of these huge quarantine stations is at once manifest.

LABORATORIES

Laboratory work on a gigantic scale, and especially on the preventive side, has become an intimate part of the medical system in the present war. The examination of the stool for cholera, typhoid and dysentery has entailed an enormous amount of work.

With the exception of the cholera imported into Italy at the beginning of the war through Austrian prisoners, that disease has not since made its appearance. Yet cholera carriers are constantly detected. This gives one an idea of the wonderful protection afforded by a modern health service.

TUBERCULOSIS

Considering the size of the Italian army, a comparatively small amount of tuberculosis has been encountered. It is stated that about 5,000 cases appeared among the 4,000,000 troops. However, it is said that more than 30,000 tuberculous Italian prisoners had

been returned from Austria. The care of these patients is now receiving much earnest attention.

Almost from the beginning roentgen-ray diagnosis was used in the detection of incipient tuberculosis. This form of diagnosis has now become the routine procedure. New recruits are carefully examined before being admitted to the army; and, as rapidly as facilities permit, those suspected of being infected are examined with the roentgen ray.

RECLAMATION

Among other activities with which the medical service is associated is an active reclamation department. The variety and quantity of articles removed from a modern battlefield are almost unbelievable; they include shoes, clothing, gas-masks, first-aid packages, brass, shells, parts of guns, motor trucks, and almost every other conceivable thing.

As soon as practical after a battle, all this paraphernalia, or as much as it is possible, is collected from the field and taken to a central depot. Here it is sorted and sent to the various factories for repairs. Gas-masks, for instance, are sent to a gas-mask repair factory, where the necessary mending is done and the mask reissued. Shoes are disinfected, cleaned and reissued. If in need of cobbling, two pairs of shoes are often made into one. The same obtains in regard to clothing. There are huge disinfecting plants and laundries in connection with these reclamation stations, for the treatment of articles for personal use. Most of the workers in these establishments are women, many of whom are recruited from among the fallen classes.

FIRELESS COOKERS

One of the striking features in connection with the provisions of suitable food for the soldiers in the front-line trenches is the very general employment of huge fireless cookers.

This enables the food to be prepared in permanent kitchens well behind the line, and assures to the soldier absolutely hot meals no matter how advanced the position in which he finds himself.

Huge shops for repairing and refitting these cookers form part of the system.

PRISON CAMPS

The prison camps at the front consist of barbed wire enclosures with good tents and excellent cooking arrangements. They are divided into three sections. The first is the reception enclosure in which the prisoners are bathed and their clothing disinfected. They are then passed into the second enclosure, where stool specimens are taken for cholera, dysentery and typhoid. After three days' detention in the second enclosure, those whose stools are negative are sent into the third where they remain perhaps several weeks until arrangements can be made to transfer them to permanent locations in the interior. For the officers, houses of a semi-permanent character are provided. One is greatly impressed by the kindliness and consideration which are shown to the prisoners of all classes. The food is the same as given to the Italian officer or soldier of corresponding grade. No work is required of officers.

VENEREAL DISEASES

No actual official records dealing with venereal disease in the army were available. At the front, however, in each army there are special hospitals for the treatment of these patients. The officers and men are not permitted to associate with any women who are not under governmental supervision. The medical officers stated that venereal disease had been reduced to almost negligible proportions.

MEDICAL SCHOOL AT THE FRONT

Among many other novelties introduced by the Italian medical service is the establishment of a complete medical school near the front-line trenches. The character of the fighting up to the present winter, has made this possible. From the beginning of the war until the autumn of 1917, practically all the active military work was done between April and November. During the remaining months when the army was comparatively inactive, all the medical students who were serving in the hospital corps or other branches,

were ordered to San Giorgio di Nogaro, at which point professors from the various medical schools who are in the army, also assembled. These professors were assigned to look after the sick in the vicinity of the school. This enabled them to use the clinical material for the benefit of the students. The buildings were mostly of temporary construction, but well adapted to the purpose. Enormous collections of bones and pathologic material generally, which had accumulated as a result of the war, were assembled there.

EFFICIENCY

Finally it may be stated that we were much impressed by the excellent care given to the wounded, and the spirit of service manifested by the medical officers. They were on duty early and late, never sparing themselves, quick to meet emergent needs, and through it all a wonderful fellowship and mutual helpfulness prevailed.

NOTE: The American Red Cross Commission to Italy was composed of George F. Baker, Jr.; John Morron; Nicholas F. Brady; Dr. Thomas W. Huntington and Dr. Victor G. Heiser. It sailed July 28, 1917, and returned to this country on October 22, 1917. After visiting institutions in England and France connected with the war, the commission was given unusual facilities for visiting the French and British fronts in France.

It then spent five weeks in Italy studying the conditions to determine how the American Red Cross could render the most efficient aid to Italy. Several weeks were spent at the Italian front. Later visits were made practically to all the centers in Italy and Sicily at which the wounded were cared for. These extended visits enabled the members to gain personal first hand information and to form an idea of the value of the work of the Italians, compared to that seen on the French and the British fronts.

Chapter III

THE SANITARY SERVICE OF THE ITALIAN ARMY DURING THE WAR

ONE of the Army organizations which has shown a surprising efficiency during the last war, was the Sanitary Corps. It was not a new organization, for there existed a special regulation on the Army Sanitary Service, which had done good work in the Libyan War, and was recognized in 1915 under special rules (Servizio di Guerra).

Gen. Francesco Testi, who was director of the Military Sanitary School in Florence, and the author of an excellent book on microbiology[1] wrote an article (January, 1917) in which he described from the beginning the wonderful display of national energy in answer to the urgent appeal of the country for an adequate provision in the immediate emergency.

A great many new factors contributed to the development of the Sanitary Service—principally, the revolution in the method of warfare establishing trench organization with slow advancement, the vastness of the front which necessitated a large distribution of ready means of medical help and advanced hospitals, the rapid formation of a large army, the threatening epidemics and the increasing rapport between the war zone and the nation.

[1]Microbiologia Pura ed Applicata, con speciale riguardo alla Tecnica Microbiologia, per Studenti e Medici, 1911.

Under these conditions, so different from those experienced in any previous war, the Sanitary Organization had to find its way amid new problems and new difficulties. But the unanimous and harmonious will of the men who realized the supreme necessity of a prompt and steady cooperation, greatly helped to overcome the enormous needs which confronted the authorities day by day, anxious of maintaining intact the spirit of the regular army corps, by disciplining the new recruits into the regulations to which they were not accustomed.

To these already difficult conditions the Sanitary Corps had to add the necessary study of complex modern medico-legal problems, the economic side of which included responsibility for many "after-war" cases, involving different studies of new pathologic forms and requiring special treatment and special hospitals. In such a contingency the Sanitary Corps had to engage some elements among the civil medico-legal authorities, selecting specialists of the different clinics, men of science, practical men, ready and able to cooperate in the difficult task of selecting, separating, rehabilitating and justly discharging the normal and the abnormal subjects of such a big army.

The service of the Sanitary Corps depends upon the Army Quartermasters in its technical administrative parts, and is divided into two sections, that of the first line, which is attached to the army corps, and that of the second line, which is practically of the Reserve and is attached to the Minister of War.

The Sanitary Corps is not a new organization, simply an improvement and extention of a previously organized body, with the application of all the new requirements

that science and experience could suggest. It is difficult to enumerate the many modifications adopted for the present needs, but it is well to differentiate the various sections of the complex service: (1) Assistance and treatment of wounded and sick of the first line, in the firing zone, and immediately in the rear. (2) Removal of the wounded and sick. (3) Sanitary materials. (4) Various sanitary services. (5) Hygiene of the troops. (6) Prophylactic sanitary service.

ATTENDANCE AND TREATMENT OF WOUNDED AND SICK IN THE FIRST LINE

The trench warfare with the long permanence of troops in one place has greatly modified the old method of assistance to the wounded and sick soldiers. The old system of a carriage standing in the rear, ready to move on or back, and of the surgical post around a tent, also ready to be moved, exists no more.

The place of the first dressing is in the trenches, and the first urgent operations are performed in the trenches, in some special locality along the line, sometimes far along the tortuous tunnelling, before the sick or wounded are carried to the stationary section in the rear. There is the advanced hospital, the place which is most important and most trying on account of the sudden appearance of many wounded sent to the nearest place for the real surgical work, before they can be removed to the large permanent hospital. Experience soon made it possible to fix in the trenches, rooms well equipped for the urgent needs of dressing patients before moving them to the rear by means of stretchers with ambulances and autocars.

While the means of transportation made possible the rapid removal of the wounded, small hospitals and special sections for infectious diseases were established as near to the front as possible, which, by the patient work of energetic surgeons, soon became important centers of treatment and operations, giving shelter to as many as 200 patients at one time.

Worthy of praise were the two hospitals designed and put into working shape by Prof. Baldo Rossi of Milan; these could be set up in less than six hours' time and were especially devoted to the urgent treatment of abdominal and thoracic cases with severe hemorrhage. Similar to these of Prof. Baldo Rossi, were the five surgical ambulances, established by the Minister of War, assigned to the army corps, which also attended to the urgent cases of abdominal and thoracic wounds.

REMOVAL OF SICK AND WOUNDED

The hand stretchers, the two-wheel and the motor-cycle stretchers are the handy means of transportation of modern warfare, but in the mountain attack at the Italian side, sleigh stretchers were used in conjunction with aerial wire ropes, over which baskets could slide from one mountain to another or down to the valley (Teleferiche).

But these means of transportation were only used from the immediate front and for short distances, while for the removal to the larger hospitals (territorial or reserve), sanitary trains were especially adapted for transport, with special accomodations for certain kinds of wounded, according to the distance.

For longer trips, special trains were equipped with appropriate rooms for medication, a small kitchen and all the comforts needed on the way. For infectious diseases special trains were used, thoroughly disinfected before their return trip.

The quartermaster had entire charge of and responsibility for the regular running of the trains, and for the personnel working under him, while the Sanitary Corps was responsible for the sanitation. The work of evacuation of wounded and sick soldiers from the small to the large military and territorial hospitals always proceeded with perfect order and discipline.

MATERIALS AND SANITARY SUPPLIES

The military authorities were equal to the urgent demand for sanitary supplies which were amply provided according to the most modern requirements, from stretchers that were continually improved, to the radio-apparatus, so as to have every small hospital at the front well supplied with the best material obtainable, notwithstanding the sudden and pressing call on the nation's resources and the difficulty in getting such a large amount of material with a limited number of factories at home, and from foreign countries also engaged in the same struggle. But the nation was equal to the emergency, and factories were soon multiplied, supplying surgical instruments and dressings, and enlarging automobile and truck factories with marvellous rapidity.

Large stores were built throughout Italy for the prompt distribution of the different supplies needed for the big army.

SPECIAL SANITARY SERVICES

One of the most humanitarian improvements accomplished by the present war has been the specialization of nervous diseases, the formation of psychopathic and neurologic departments for the study of all sorts of nervous disturbances, aggravated by military life or by camp influence and circumstances, and nervous lesions consecutive to traumatic injuries in service or in battles.

The medical, surgical and medico-legal side of such delicate, valuable studies were conducted not only from a scientific but also from a practical point of view, and the results have been most gratifying.

Another very important service which produced most valuable results was the stomato-odontoiatric department, which rapidly became a hygienic necessity for the army.

Similar special departments were established for syphilitic and skin diseases, and for eye, nose and throat troubles.

Soldiers were instructed for the special work of disinfection, and these were scattered along the different railroad stations, ready for the service of disinfection to combat any fresh manifestation of epidemics.

A corps of specialists in bacteriologic work was sent to the various laboratories, provided with abundant material for research and examinations.

HYGIENE OF THE TROOPS

The modern war of trenches necessitates a period of rest, during which, besides the physical and mental

rest, the soldier has a chance to undergo a thorough cleaning, general restoration to normal life, and preparation to return to the front.

The work in the trenches has been a new study of cement and architectural devices to make life possible and tolerable during the hard winters and the rainy seasons, beside the difficult attempt to keep the narrow shelter clean and free from vermin and all sorts of infections. Special rooms were built for temporary treatment of simple diseases, and storerooms for medicines and provisions necessary during such a hard life. An abundant provision of filters of every kind and different means of purifying the water were placed at the disposition of the Sanitary Corps and freely distributed along the trenches, where frequent examinations were made to ascertain the potability of the water.

PROPHYLACTIC SERVICE

It is well known that one of the most common dangers deriving from a war is an epidemic which can spread either from the civilian population or from the army.

One of the most important tasks of the Government was to keep a very careful watch over the sanitary condition of the civil population through which the army corps had to pass in the continual dislocation of soldiers for the strategic movement of troops. This difficult and complicated work of the civil and military authorities was accomplished by mutual accord, and reciprocated help in which the strong patriotic sentiment for the country always prevailed.

In this way several threatening dangers of epidemics

were checked at the very beginning, thanks to the most complete organization formed by a representative of the general Department of Public Health, some superior officers of the Army, a general from the Army Staff of Quartermasters-General. From that great body, several subcommissions attended to the provisions in the different districts and sections.

A sort of vigilant commission presided over the work of evacuating the different hospitals at the front, watching carefully the distribution of every patient so as to prevent the danger of spreading infectious diseases among healthy communities.

To dispose of suspicious cases, several hospitals of observation were organized and equipped with bacteriological laboratories in which patients were quarantined. At the most advanced zone a movable disinfecting train, carrying baths and special stoves invented by a genial Italian officer for rapid disinfections of parasites, was placed at the disposal of the military authority.

Hospitals for exotic diseases and others for convalescents were organized not far from the fighting zone and located in the most convenient positions for that purpose.

Prisoners and working men employed by the army were continually under strict observation, since they were the refugees of provinces occupied by the enemy.

Of all the work done by the different sections a careful report was regularly transmitted to the central organization with remarks and modifications suggested by the circumstances, so as to keep the field open for additional improvements.

Chapter IV

A SCHOOL OF MEDICINE AND SURGERY DURING THE WAR

As soon as Italy entered the war, the necessity for providing a sufficient Medical Corps for such a large army, compelled the Minister of Public Education, upon whom depend all the universities, to issue an order for an acceleration course of studies for the medical student of the sixth year. But, in view of the possible length of the war, it became urgent to provide for the education of the students of the fifth year, drafted at the front for regular service, so as to save them from losing their coveted time of study, and likewise prepare them for efficient assistance in the service.

San Giorgio di Nogaro, a small town near the front, was selected and several buildings of appropriate light structure were erected with all the necessary sections for lectures, laboratories, dissecting rooms, operating rooms and annexes required for a well-organized school.

The school was inaugurated on February 13, 1916, with sixteen different courses, the principal being: the Surgical Clinic and Operative Medicine, directed by Prof. Giuseppe Tusini of the University of Modena; War Traumatology, directed by Prof. Lorenzo Bonomo of Rome; Prosthesis and Surgery of the Limbs, Prof. Bartolo Nigrisoli of Bologna; followed by those of

medicine and the different specialties. The professors were assisted by the free docents who were in service.

Everything was organized according to the military method and discipline, and the students were given every opportunity for practical instruction in the different wards of the nearby hospitals crowded with every kind of surgical and medical patient. Abundant material for autopsy, dissections and pathological work was utilized in different sections, especially built and adapted.

Three hundred and fifty-six students of the fifth year and ten of the sixth, from various universities of the kingdom, took advantage of the school of San Giorgio di Nogaro, in which 245 autopsies were made by the teacher of pathologic anatomy, and 5,977 patients were used for clinical instruction in every subject, with the great advantage of comparative studies in each case.

The favorable condition of the quiet little town and the compact arrangement of the buildings for lectures, laboratories, clinical and experimental work, made it convenient and easy for the teachers to attend to their scientific and practical work.

The final result of the experiment fully justified the large expense and the trouble in organizing the institution. For, if the pupils of San Giorgio di Nogaro had been left to their regiments, and to the menial work of soldiers, they would have been lost to the profession for lack of tuition, and their valuable help would have been lacking in the work of the much-needed medical relief at the front.

Gathered at San Giorgio di Nogaro, in fraternal

reunion, in their familiar schools, which otherwise they would have been obliged to abandon, the pupils realized the importance of tuition not only for their immediate benefit but also as an advantage to their future careers and, prompted by emulation and competition, made a success of that rather original experiment.

Chapter V

MEDICAL ORGANIZATION AND EFFICIENCY DURING THE WAR

THE Sanitary Organization of the Army, which started under serious difficulties in the beginning, gradually improved, and the initial deficiency, which had been experienced also by all the other nations at the sudden call into service, was soon overcome.

Within a few weeks of the declaration of war, everything was ready, from the first place of attendance at the front to the last territorial hospital in Italy.

This was particularly due to the immediate and opportune fusion and cooperation of the civil and military authorities, which became a powerful means of fighting and preventing, from the very beginning, the various and terrible epidemics that brought such mortality amid the enemies' camps, avoiding a disastrous panic among the people whose endurance was already severely taxed from so many other sources.

It can be said with justice that war surgery in Italy rapidly developed so great a degree of efficiency that the wounded men had the most complete and the latest modern treatment skillfully applied at the front as well as at the last institution prepared for that purpose.

The national mobilization of the Medical Corps was accomplished with the greatest care. The best men among the most experienced surgeons were selected,

according to their age and their physical condition, to occupy the advanced or the rear position as chief surgeons to each section.

An institution belonging entirely to modern warfare was soon adopted in the movable hospitals, which were fitted according to the modern requirements and placed under experienced specialists, well assisted, ready to give urgent, immediate care especially to abdominal and thoracic wounds. These hospitals could be rapidly mounted and dismounted for quick transportation to the nearest point of an impending action, so as to be ready for instant and close attention to cases, thereby saving lives threatened by grave hemorrhage.

At the Surgical Congress of Bologna (March, 1917) Dr. Calabrese reported 36 cases successfully cured by immediate intervention, and Dr. Baldo Rossi of Milan told of 47 cases successfully discharged after similar instant operation in the movable hospital.

To these reports must be added the statistics of Drs. Bozzi, Nigrisoli, Bastianelli, Saviozzi, which give undisputed proof of the value of these movable hospitals and the possibility of saving life in so many cases which otherwise would have been fatal.

From the first post of medication at the front (where a mere summary work can be done) the wounded were moved rapidly to the different sanitary sections in the immediate rear, where they received the first real treatment, before being sent to the camp hospitals a few miles behind. Here in the camp hospitals, the real work is done by the best young surgeons who have accomplished miracles of splendid surgery under the most trying conditions, as can be learned from very accurate

reports published by the head surgeons, like the one of Dr. Saviozzi, and another of Dr. Gherardo Forni.[1]

The various medical journals, *The Surgical Clinic, The Polyclinic of Rome, The Hospital Review,* and many others have given accurate accounts of original work, and have published a great many articles on surgery during the war, which constitute the most important collection of valuable studies on war surgery.

In the little field hospitals (Ospedali da Campo) most of the urgent surgery has to be done according to the seriousness of the injury and the immediate need of intervention. As soon as possible, these cases are transferred to a larger hospital to complete the cure. One of these institutions is the Military Hospital of Turin, built in 1912, with a capacity of 2,000 beds. It is located in one of the healthiest and most attractive parts of the city, was constructed according to the most modern plans and requirements possible and furnished with every modern appliance that science and experience could suggest.

With the purpose of further intensifying the surgical assistance, the Minister of War, in April, 1918, created the so-called "Surgical Groups," each directed by an expert chief, assisted by two surgeons and two sanitary helpers, kept in readiness for immediate dispatch where the work was most needed. Such groups proved to be most efficient, according to the reports published in their *Journal of Military Surgery*. Many territorial hospitals were organized with astonishing rapidity all over the country, and every country physician, as well

[1] Surgery in a Camp Hospital in the Second Line—Clinical Notes, Observations and Operations upon 5,200 Wounded.

as every clinic, public or private, was mobilized and militarized.

Each hospital was supplied with a radio-apparatus (some with the ingenious modification of Gen. Luigi Ferrero di Cavallerleone).

War surgery was discussed and popularized by an abundant and valuable literature published in the *Surgical Weekly* and in magazines which reported also a synopsis of home and foreign work.

Italy may well claim the birth of war surgery, for, unfortunately, she has been for centuries the battle-field of all Europe, and many of the remedies used today were old panaceas of the Middle Ages. Prof. Davide Giordano in his book, reviewing the old systems, points out that many modern discoveries were already practiced in ancient wars. He mentions three great Italian surgeons, Palletta, Monteggia and Rima, who, in the wars fought between the years 1800 and 1820, were already recommending the continual irrigation of wounds with a solution of 1 per cent of table salt (hypertonic solution recommended at present by Wright), and also the boiling of linen waste in a very weak solution of soda (the present alkaline solution). Larghi of Vercelli, as early as 1842, published his experience in cases of suppurating wounds, in which he had marvellous results by using solutions of nitrate of silver, from small doses to the pure sticks, according to the location, character and condition of the wound, exactly as it was advised recently by Danysz.[1]

The same thing can be said of hypochloride, which was used very extensively, during the middle of the

[1] *Acad. roy. d. sc.*, Par., January, 1915.

last century by Professor Gallozzi of the University of Naples, author of a well-known treatise of surgery and by Professor Durante at the polyclinic of Rome.

The wonderful activity of the Italian military surgeons was brought before the public at the Surgical Congress of Bologna in March, 1917, where convened from every part of the front and from every territorial zone the representatives of Italian surgery. Every topic, subject and argument were discussed, not only from the standpoint of personal experience, but also from the more positive point of statistical reports and references.

Drs. Bastianelli and Donati, reported the successful immediate treatment of deep wounds by large incisions and the excision of the affected tissues with successive suture and primary healing.

While the method of Carrel was extensively used, the special solution of Dr. Giannattasio (hypochloride of lime, bicarbonate of sodium and boric acid, called Chlorosol) was largely used with success.

Dr. Schiassi of Bologna read a paper on a "New Biological Treatment of Acute Surgical Infection, Especially in War Wounds," consisting in the immersion of the injured part in a solution of 8 NaCl, 0.30 chloride of potash, 1 chloride of calcium, 1.50 glucose, 2 citrate of sodium, 0.50 hydrate of sodium, pure, in 1,000 parts of water at a temperature between 38 and 39°C.

In the unfortunate cases of gas gangrene, Dr. Camera, after describing minutely the pathogenesis and the mode of diffusion of the infection, reported the cases in which he dissected carefully the affected

muscles, removing the suspicious part as in a case of a tumor, and packing with oxygenated water.

Dr. Alessandri of Rome reported extensively on surgery of the head, and Drs. Bastianelli of Rome and Morelli of Pavia, both read some very interesting contributions to the surgery of the thorax, illustrating their cases with new observations and new methods of treatment worthy of the highest consideration. The application of an artificial pneumothorax in the treatment of pulmonary wounds with grave hemorrhage was described with statistics by Dr. Morelli, showing successful results. Dr. Morelli's method was soon universally adopted as the most rational and practical, because, by removing the blood from the pleura immediately, it prevented an infection, and with it the subsequent adhesions and impairment of the lung functions. Also the introduction of sterilized air, compressing the wounded lung, arrested the hemorrhage and allowed the immobilized lung to heal rapidly. Dr. Morelli has published his discovery and method of treatment in book form, which has recently been translated.[1]

The directors of the movable hospitals, Drs. Calabrese, Bozzi, Rossi, Nigrisolli and Bastianelli contributed largely to the subject of abdominal surgery, reporting hundreds of operations, of which they told in detail the complete histories, accompanied by valuable comments and conclusions.

To give here in detail the work of that memorable Congress of Bologna held in the most critical moment

[1] The Treatment of Wounds of Lung and Pleura, by Eugenio Morelli. Translated from the Italian by Lincoln Davis and Frederick Irving, Boston, 1920.

of the war would be too stupendous an undertaking, but the benefits which resulted from the reading of so many valuable papers, and from the broad scientific discussions which followed each lecture have been remarkable. A good many new methods and a good many modifications of old methods of operation and treatment of all sorts of injuries were brought to light and were made popular among many young and alert physicians and surgeons, who took advantage of that unique opportunity of learning, which resulted not only in the personal benefit of each one, but also in the benefit of humanity at large as a universal advancement in scientific studies and researches and their practical application.

Chapter VI

ASSISTANCE TO INVALIDS AND THE WORK OF RECONSTRUCTION

THE matter of assistance rendered invalids and the reconstruction of those mutilated in war deserve special mention here, and I wish to pay my tribute of admiration to President Dr. Francesco Durante, professor of the surgical clinic at the University of Rome, and to Vice President Dr. Enrico Burci, professor of the surgical clinic at the Institute of Florence.

In a very elaborate volume, published by "Unione Editrice" of Rome, the National Federation gives a special report of what was done in the cities of Ancona, Bologna, Florence, Genoa, Milan, Naples, Padua, Palermo, Perugia, Pisa, Rome, Rovigo, Turin, Udine, Venice, Verona and Vicenza. This large and beautiful volume, profusely illustrated with pictures of the various institutions, which were expressly built or adapted for the purpose, from suitable buildings, and the setting forth of the different methods of treatment, with an accurate description of the ingenious devices and apparatus made by expert mechanicians, was a credit to the organizers of the undertaking; so much more creditable because the idea came almost entirely from the initiative of local committees under the direction of the National Federation.

Special attention was given to the description of the different methods of prosthesis and the careful system adopted for the gradual application of the proper apparatus made and developed for the relief of the mutilated in each case.

Prof. Vittorio Putti, director of the Rizzoli Orthopedic Institute in Bologna, who served as a colonel in the Medical Corps at the Italian front, first at the invitation of the English Government, and afterward at the special invitation of the International Conference on Rehabilitation of the Disabled (March 18 and 21, 1919), delivered in London and in New York several lectures, in which he explained the working of the organization in Italy, and the systems and methods used generally by the Italian surgeons especially appointed for that kind of work.

In an illustrated lecture Professor Putti describes in an incisive manner, a method invented by an Italian physician twenty years back, consisting in the utilization of the power of the muscles of amputated limbs, to create movement in the different parts of the prosthetic appliances. Dr. George David Stewart, the well-known professor of the surgical clinic at Bellevue Hospital, New York, successfully applied this method in 2 cases, and it is to be hoped that his example will be followed by others, thus popularizing in America the practical discovery of Dr. Giuliano Vanghetti of Empoli (Tuscany).

With the kind permission of Professor Putti, I reprint his two lectures, which fully explain the method and its applications.

NATIONAL ORGANIZATION OF REHABILITATION FOR THE DISABLED IN ITALY[1]

The work done by Italy for soldiers crippled in battle is so vast and complex that it will be a difficult task to give briefly an exact idea of it. Now that the war is over, it may seem superfluous to refer to what was accomplished during a period which we hope may never again be repeated; but we think the work achieved should be divulged because it can serve as a basis and outline for that more extensive and lasting work which is expected now for the betterment of industrial cripples.

We have, therefore, enthusiastically accepted the honorable invitation of the American Red Cross because we realize that in no other country as much as in this one, where the enormous industrial development brings the number of accidents during work to a formidable sum, can the knowledge of our experience be more useful and beneficial. The United States, which is a leader of civilized nations in the matter of social welfare, taking advantage of the example of European countries will soon discover new ways and methods to succor those who are crippled in the various branches of industry.

From the beginning of the year 1915, when Italy had not yet declared war, throughout the entire country the grave question of the assistance of the disabled was discussed. By means of publications, lectures, meetings, the public was kept in touch with the very important problem and convinced of the necessity for a thorough collaboration toward the performance of the high duty. The country responded with unanimity of opinion, and before the end of the year, committees were formed, sufficient funds had been collected for the establishment of the first societies for the moral and material relief of the war's disabled. In Italy, as in many other countries, the development of these organizations for the social welfare of these handicapped men is all due to the initiative of private individuals.

Before the war, Italy had no institution whatsoever which could serve as an example for future work. In Milan, alone, there existed

[1] Presented at the International Conference on Rehabilitation of the Disabled, Section XVI, New York, March 18 to March 21, 1919.

Handicraft School for War Cripples at Milan.

a school for the vocational education of disabled civilians, which, however, could only aid a very limited number of patients; there were not lacking, though, men experienced in this regard, to whom we owe the rational and practical methods adopted from the beginning by Italian organizations. In order that the committees in the various regions of Italy might work with uniformity of standards, in 1915, at Rome there was founded the Federation of Committees for the Relief of the Disabled, and to this organization goes the credit of intense propaganda, and the collection of huge funds.

The larger cities of Italy were immediately provided with institutions especially suited to the cure and training, both functional and vocational, of the handicapped men. Among these the principal ones are Milan, Palermo, Bologna, Turin, Florence, and Rome. Soon this example was followed by other centers, and there sprang up schools in Genoa, Pescia, Naples, Pisa, Leghorn, and Venice. But in the place of private initiative came the government's action.

The task was undertaken on the one hand by the War Department, and on the other by the National Commission for the Relief and Protection of the Disabled, provided for by the law of March, 1917. This law not only provides for the technical re-education, but also for the important and complex problem of the after-care and social assistance of the individual, whether he be incapacitated by injuries or disease.

I do not think it necessary to dwell at length upon the description of the work during the first periods of medical care.

From the field hospital the disabled soldier is sent to the base hospital, especially built for this purpose. The selection of the hospital is made according to the custom of sending the injured man nearest his native town or his family.

There are exceptions made to this mode of selection in the case of the so-called *ultra disabled*. These are the men who, on account of the seriousness and quantity of injuries, are not only unable to readapt themselves to any kind of profitable labor, but cannot even provide for themselves the necessities of life.

Sent on to Florence, these ultra disabled find refuge in a rich

and sumptuous villa, in the thick of the woods, and there enjoy all the advantages of a moderate climate.

In the base hospitals for the disabled, the cure is completed by the psyohotherapic and orthopedic treatment, with a view to reducing to a minimum the effect of the injury, and to preparing the stump for the application of the artificial limb. From this moment the work of encouragement of the disabled begins, with the object of convincing him that he is still capable of profitable labor, of inducing him to re-train, of entertaining him, and diverting his thoughts from his injury. A few of the halls in the base hospitals are set apart for this purpose and turned into laboratories and classes; these are maintained by civilian committees which take an active interest in the work of technical training and after-care. When the patient is pronounced physically cured, he is given one month's leave before commencing his re-education. This period of leave has been found advisable not only to give the patient the liberty to return to his family and friends, if he so desires, but especially to give the temporary artificial limb enough time to produce on the stump the transformations which are necessary for the fitting of the final appliance.

As to this method which has been followed in Italy, with regard to the construction of artificial limbs, I will not now go into details, because this subject will be more fully treated by me in another report. The production of artificial limbs, which was at first insufficient as to quantity and poor as to quality, is now completely satisfactory. The really remarkable progress made by Italy in this field was universally recognized at the London exposition, May, 1918, on the occasion of the Interallied Conference.

Both the War Department and the National Commission appointed committees composed of persons competent in orthopedics, and of representatives of the Association of the Disabled, who were to control the work of each factory for the construction of artificial limbs. Recently the War Department has adopted a standard type of appliance for use in the case of amputated inferior limbs, which has not yet been tested. Two central commissions residing in Rome, are entrusted with the problem of encouraging new developments in the construction of artificial limbs, by examining models submitted, by organizing contests, etc.

At the end of the physical and orthopedic treatment the disabled remains in the school for vocational training. This re-education is not compulsory in Italy, but the law commands that each man, after having recuperated physically, pass at least fifteen days in the training school. This provision of the law which has been made by the government upon the example of the Bologna School for Vocational Training, allows the invalid, perhaps ill-disposed toward this re-education, to witness its good effects, and results in the vocational training of a far greater number of men. To give an idea of the tendency of the disabled to undertake vocational education, I will say that in the Bologna School 60 per cent of the handicapped have accepted to be trained.

These schools, although founded by private initiative and local committees, are under the control of the War Department and the National Commission. The War Department since 1914, has appointed a special inspector in the person of Prof. E. Burci, president of the Italian Section of the Interallied Committee, whose aim it is to combine the work of the military authorities with that of the local committees and distribute equally the material and spiritual assistance to the handicapped. The National Commission has control over the re-education schools through local committees, which during the first period of the war spontaneously undertook the establishment of vocational schools. It is a fact worthy of note, that there exists in Italy a flourishing Association of Disabled Soldiers and Sailors, with a membership of about 50,000, which acts in strict unison with the military authorities and with the National Commission, in all that regards the social welfare of the disabled.

In view of the enormous expense entailed in the adequate development of the training schools the government has granted the Committees a daily subsidy for each disabled, amounting to 3.50 *It. lire* for the indoor patients, and 2 *It. lire* for the outdoor patients, for a stated period of not more than six months. In many cases, however, this period of time is much too short for a complete training, and under those circumstances the local committees provide out of their funds the amount required for the maintenance of the injured during his entire stay at the institution.

The Committees generally grant a small daily allowance to their pupils, about one *lire;* part of which is put into savings banks and given to the disabled when he leaves the institution. Various committees, besides, furnish the handicapped man with the tools of the trade for which he has been trained.

We, in Italy, are convinced that the resident system is greatly superior to the non-resident system, and we have, therefore, put the former into more extensive practice. Experience has also taught us that the larger institutions are more efficient than the small ones, and the National Commission has, therefore, decided to give the maximum support to the more active and best-organized of them.

Our disabled generally find in the schools the training they require. The more common trades taught are: shoemaking, tailoring, saddlery, carpentry, mechanical trades, bookbinding, etc., furthermore, all trades indigenous to agricultural districts, as, for instance, basket-making, cartwright, and cooper trades, etc. Then there are also the commercial courses: bookkeeping, typewriting, drawing, telegraphy; all the disabled are compelled, besides, to attend elementary courses of study for a few hours each day.

In dealing with the disabled man in the choice of his occupation, I will quote the conclusions to which Mr. Chevelley has arrived in an important study of the question of which he has acquired a vast experience:

1. Whenever it is possible, the disabled men ought to be retained in the trade followed by them in the pre-war days, or in one similar to it.

2. The above rule ought to be applied especially to agricultural laborers, who constitute in Italy about 85 per cent of the total number of disabled men.

Through the efforts that have lately been made by the League of Assistance committees, and by the individual committees as well, laborers have been induced to return to the land, disabled men having become convinced of the advantages accruing to them and their families by so doing. This is a step, however, to be taken only after the disabled men have learned the use of labor appliances suitable to each particular case, and on their completing

a course wherein they have been taught the rudiments of modern agriculture; in this way, and in spite of their physical disability, they may obtain from the land a much better yield than they would have done had they persisted in following the ancient methods.

3. In view of the very large number of disabled men who aim at obtaining small government appointments, the necessity has been recognized of discountenancing their applications, and by so doing, sparing them many future disappointments; it has been also recognized that it is infinitely preferable to give the disabled men a thorough training in appropriate trades and callings which, besides being of a more profitable and independent nature, are also not quite so much sought after.

4. The authorities have also come to realize the necessity of discouraging the tendency, which has increased to big proportions, of crowding into the cities. This has been obtained by persuading the disabled men to return to their native towns or villages as much as possible.

As far as regards the agricultural training, which, naturally is of so great importance in Italy, in spite of the good attempts made here and there, it is still very far from being considered with that broadmindedness and seriousness which it deserves. Many re-educational schools are provided with specially organized departments for agricultural training; as, for example, Florence, Genoa, Leghorn, Modena, Pisa, Rome; then there are the agricultural branches in the professional colleges, which as a consequence of their development have assumed an almost autonomous management, as, for instance, the schools of Milan, Palermo, Pescia. And finally, we have the schools exclusively dedicated to agricultural training of handicapped men, as in the case of Ancona, Lecce, Perugia, Voghera, and Turin. However great this number of schools, their efficiency is very poor and we are still very far from obtaining those good results which we were somewhat entitled to expect.

The problem of placing the re-educated man has been carefully studied in Italy. To take the place of the local committee's action soon came the National Federation of Committees, through whose

influence was formed the central employment office which quickly gave truly remarkable results.

To these various relief organizations later came the aid of the National Association of the War's Disabled whose constitution had not overlooked the great essential item, *i.e.*, the employment of its members.

The action of the government for the solution of this grave question came later and took the form of the law of March 25, 1917, of which I have made mention, and which indicates to the National Commission the plan to be followed in placing the remade man.

According to the new law, soldiers, who in accordance with the existing regulations have been declared disabled, may, when their disability allows, remain in the army with the military authorities' consent.

With regard to the readmission and admission into public offices and works, the facilities which the law grants may be divided into three categories: the right to readmission to the offices, the bestowal of posts without competition, and the preference in competition where talent or attainments are equal.

Another opportunity granted by the law is that on the basis of which the condition of being a disabled man constitutes a right to precedence in the case of equality of talent and qualifications in the graduation of competitors for admission to public employment. Facilities of general character have also been granted both by law and regulations which are intended to give aid to the disabled in obtaining employment by private concerns or individuals.

In the concessions of posts or scholarships not destined to benefit any designated families, preference is given to the disabled and on the same terms as the other competitors, to their children. As far as is applicable, the legal privileges obtained for war orphans are extended to the children of the disabled.

It is finally stated that all accident insurance, taken out in connection with the work of disabled, re-employed in any kind of factory, is compulsorily assumed by the insurance institutions, and that in the employment of the disabled, as element for the

valuation of the risk, this would become necessary only if their number exceeds a certain limit.

As regards the pensions, I can only give you here a very short account of what Italy has done. This matter has been adequately treated, from all points of view, by Major Giuriati, at the Interallied Conference at London in May of last year.

The problem of the distribution of pensions is now entirely in the hands of a department especially created in November, 1917.

According to the regulations that formerly existed, the different degrees of disablement were classified in three separate categories only; such an arrangement was far from being in accord with the variety and extension of the subject. For each one of these categories, as was prescribed in the past, a stated amount used to be contributed as indemnity; such an amount was by no means a just or proportionate value, and as a result either the soldier or the government has to sustain serious financial loss.

According to the former regulations, it was understood that the title to pensions was limited to the men's unfitness for military service. This has been substituted for the larger conception of the men's greater or lesser fitness for the undertaking of lucrative labor.

The government's intention is to compensate the individual for the diminishing of his powers for lucrative work, and proportionately to his physical disablement.

Consequently the different degrees of disablement for which pensions are now given have been subdivided into ten categories instead of only three as heretofore; this is proving a much easier arrangement, and infinitely more in proportion to the exigencies of the different cases.

According to the first eight categories, the subject is entitled to a pension, while for the last two he receives a temporary allowance. The former refer to permanent disablement of a greater degree, which minimizes the working power of the individual. The allowances are given to men suffering from lesser degrees of disablement, which cause a much smaller, if any, reduction of the individual's earning capacity.

In cases referring to a presumable modification or aggravation

of the degree of disablement in so far as they may affect the men's working capacity, the decision stating the amount of pension to be paid can be twice revised within the period of five years.

The current regulations tend to facilitate in every way possible all the proceedings, which have been greatly simplified. The facts are submitted to only one medical board, and the interested party has seven days allowed him to consider their decision, either favorably or the reverse. Should he refuse to accept it, the matter is referred to a Commission of Appeal, which consists of one of the directors of the Military Board of Health, of two army and two civilian doctors, one of the latter being appointed by the National Association among the disabled men, the other by the Local Committee dependent from the Ministry of Pensions and of Military Assistance. In this manner both the interests of the soldier and of the government are safeguarded.

A further modification has been brought with regard to ascertaining whether or not the injury is due to service reasons. This has been greatly facilitated by the acceptance, as evidence, of the declaration of one of the hospital directors or of one of the commandants of the regimental depots.

So liberal an interpretation has now been given to the conception of service reasons that the very fact of the man having been on duty is considered sufficient, and this has been of enormous importance with respect to disablement caused by illness (tuberculosis).

The maximum rate of pensions is allowed for disablements included in the first category (100 × 100). As for the disablements included in the other categories—from the second to the eighth inclusive—they are calculated proportionately at 80, 75, 70, 60, 50, 40, and 30 per cent of the pensions allowed for the first category.

Whenever the degree and nature of his disablement cause the soldier to require the assistance of another person, he is entitled to a supplementary allowance over and above his pension.

The disablements belonging to the ninth and tenth categories call for a temporary allowance, instead of the pension for life. This allowance is equal to the amount of the pensions belonging

to the eighth category, payable in one lump sum, and calculated for a period that varies from a minimum of six months to a maximum of six years.

I must say a few words before terminating on the assistance given the blind, the mutilated in the face, and the tuberculotics.

The Blind.—At Milan, Florence, and Rome, concentration hospitals for the blind have been erected. From these hospitals the soldiers, pronounced completely and irreparably blind, are transferred to the special hospitals or schools in Florence, Rome, Naples, Milan, Padua, Catania, according to the locality of their birth, for their re-education or after-care.

The work of the re-educational school is greatly simplified by a disposition of law which provides that the blind soldier, when still in the concentration hospitals, be given a practical view on his new life and a methodical sensorial education.

In the vocational schools, the trades most frequently taken up are: Cane chairmaking, brushmaking, shoemaking, bookbinding, wood carving, etc.

The choice of the trade, though often made by the Council of Directors of the schools, after an adequate test period, is left free to the injured. The work of the blind is generally simplified by the use of special apparatus.

In the Vocational School at Florence much experimenting has been done, and successfully, with training the blind for agricultural occupations. At Rome the wood and leather trades have succeeded best. The more cultured blind are encouraged to become masseurs, linguists, musicians, or office employees, as typists, etc.

From the employment point of view, Signora Mandolfi, who has shown an intense interest in this end of the work, maintains that the blind man should be induced to take up individual autonomous work, whether at home, in the factory, in the office, and among persons who have their sight.

Assistance to the tuberculous soldiers.—According to the law dealing with the assistance to the disabled, the patients suffering from tuberculosis are considered as belonging to the disabled class, from both a physical and practical point of view. The question of tuberculosis has been sadly aggravated in Italy since the return

of our prisoners of war, who left behind them in the cruel Austrian concentration camps, their health and youth, coming back to us only too often inexorably tainted with this terrible malady.

The antitubercular fight was begun by the Circular No. 801, of December 20, 1916. In obedience to this document, in every territorial army corps, and at the base of every army in the war zone, special sections for the diagnostic study of incipient or latent symptoms of this malady were created.

The first symptoms having been discovered in time at these diagnostic sections that are under the management of specialists, the patients are promptly sent away from the ranks of the army, and benefit by a whole series of dispositions and provisions especially drawn up with a view to receiving them, treating them, and giving antitubercular instruction.

A medical center for the selection of tuberculous soldiers was at first established at Nervi. This is a big first-grade institution for the gathering together of the numerous tuberculous patients that have been returned to us by the enemy, where the diagnosis is made, and the degree of specific lesion ascertained before transferring the patients to other hospitals adapted to their cases.

Contemporaneously with the institution of the health center at Nervi, which can accommodate 1,200 patients, another center for selection of more than 600 beds was set up in the rear of the war zone to gather together and select the patients coming from the ranks of the army.

The second sanitary center for selection, organized on the same lines as the one at Nervi, was opened at Careggi, a locality not very far from Florence.

By both these said centers, as in all the other diagnostic sections belonging to the various army corps, the patients are divided into three categories, according to the gravity of the sickness.

As soon as the condition of the men is ascertained, they are received in special tubercular wards at the different hospitals where these same wards have been instituted in the territories belonging to the different army corps.

The patients who are not so seriously ill are sent to appropriate sanatoria that have been instituted in each territorial army corps,

where they are kept for about three months, and where, once this period passed, they are given their discharge. With their discharge, however, the assistance given to this class of disabled men does not cease. As a result of an agreement between the Ministers of War and of the Interior, all these patients are entitled to continue to receive all possible assistance, both medical and practical, unless they end by being recognized as disabled as a result of war service and, as such, entitled to all their pension rights.

The military administration has decided to grant, instead of the bonus, equal to a year's pension, that they used to pay now and again to these sick men, an allowance of so much towards their treatment (assistance allowance) every time that the ex-soldier has to return to the hospital during the three succeeding years after his discharge.

An equal sum is to be paid to each patient by the Ministry of the Interior, so as to total a daily sum equal to Lit. 5 per diem.

During the detention of the discharged soldier in the sanatorium, the respective families will receive a daily allowance equal to the separation allowance given to the families of the soldiers called up for military service.

With regard to the men who have a latent form of tuberculosis, they are sent to special sanatoria for treatment of initial tuberculosis (climatic institutes) generally under the direction of the Red Cross; of these, there are already three of some importance: Bergeggi near Genoa, Fara Sabina near Rome, and Milanino near Massa Marittima; the patients can remain in these institutions up to six months entirely at the expense of the military administration. Once this period of treatment is over, this same administration reserves the right to have the patients re-examined at the diagnostic sections, where it had been decided to have them sent to these sanatoria, and where further decisions as to the care of the men are taken.

In the help of tuberculotics, the government and Italian Red Cross have been materially assisted by the aid of the American Red Cross.

From the very first months of the war, much has been done for the aid of those facially mutilated and those whose nervous systems have been seriously impaired.

For the assistance of the former, concentration hospitals conducted by specialists were erected in the war zone. From these, the injured are sent to the base hospitals where all possible aid is given them, not excluding prosthetic applications. In this field the Italian stomatologists have accomplished a truly admirable achievement. The prosthetic appliances are furnished by the government with the same criteria as those used in the distribution of artificial limbs.

Similar organizations have been instituted for those suffering from impairment of the nervous system.

From the concentration hospitals they are sent to the so-called *neurological centers* in the principal cities. Each of the centers is divided into two sections: One for the patients suffering from organic injuries, the other for those displaying neuropsychic phenomena.

These centers are under the supervision of the local committees for moral assistance, technical training, and re-employment; the same routine is followed here as in the case of the other disabled.

During the last months, there have been instituted at Milan, with funds collected from public charity, two hospitals exclusively for the moral aid and re-education of the severely injured in the spinal cord and the brain.

I have given but a pallid idea of what Italy has accomplished and is accomplishing in behalf of her war cripples. Now that the war is over, many of the provisions to which I have alluded have been somewhat modified and must naturally, in time, undergo further changes in accordance with the new requirements.

But the foundation which the nation has builded so fervently, enthusiastically, and wisely will remain to testify before all the ages to the magnificent performance of this high duty, and serve as a basis for the future development of the great work in the interest of the industrial cripples.

THE UTILIZATION OF THE MUSCLES OF A STUMP TO ACTUATE ARTIFICIAL LIMBS: CINEMATIC AMPUTATIONS[1]

It affords me the greatest pleasure to place before the British medical profession the facts as to what has been called cinematic amputation. I feel this all the more because I am thoroughly convinced of the enormous advance which the conception of cinematization will bring about in the treatment of disabled men, and believe that all that concerns this new current of ideas, as well as the store of facts related to them, ought to be placed at the disposal of the world at large.

In briefly reviewing the fundamental theories of plastic motors, and pointing out the vast field thus thrown open to the activity of orthopedic surgeons and mechanical engineers through the practical application of these theories, I venture to express the hope that our efforts may prove welcome to all those who have hitherto had no opportunity of studying this important scientific innovation.

Whilst in Italy the tireless work of propaganda undertaken by Dr. Giuliano Vanghetti, the original exponent of these theories, has led to their full discussion and close study and to many experiments, and whilst both German and Austrian scientists have been actively working to obtain the most practical application of these same theories, the medical literature of France, England, and America contains very few, if any, allusions to the subject.

In the space at my disposal I must content myself with outlining the fundamental principles upon which the theory is based, pointing out, as briefly as possible, the various ways it can be put into actual practice, and making a short statement as to the method of operation and the results.

The possibility of utilizing the functional resources of the stump so as to convey movement to the artificial limb was an idea that came to Dr. Vanghetti first in 1896, at the time of Italy's second expedition into Abyssinia, when soldiers who had been taken prisoners by the native forces under the Negus were cruelly tortured and mutilated.

[1] Address by Professor Putti before the Royal Society of Medicine, London, March, 1919.

From that time onwards Dr. Vanghetti wrote and published innumerable articles, wherein he developed his theory on what he had now named "cinematic amputation." In them he described very fully the origin of his idea and the various methods by which it could be practically applied. Unfortunately for the speedy acceptance of this most novel and useful idea, Dr. Vanghetti, though his originality, cleverness, and ability are indisputable, is not a surgeon, but a physician, and for this reason was unable to put his theory into practice. He was therefore forced to resign himself to endless delays before he succeeded in convincing surgeons of the great value and practical possibilities of his theory and obtaining their cooperation, which was indispensable to any adequate test. This was the principal reason why, prior to the war, the cases of cinematic amputations did not number more than twenty.

THE PRINCIPLES OF CINEMATIZATION AND OF "PLASTIC MOTORS"

Dr. Vanghetti has given the name of "cinematic plastics" or "cineplastics" to any kind of bloodless or operative plastics that tends to economize, restore, or substitute those muscular masses that can be employed to impart direct and voluntary movement to an artificial limb.

The word "cinematization" was formerly used to indicate the cineplastic operation; it was subsequently applied to every kind of cinematic artificial limb, and finally to the active and early mobilization of muscles involved in cineplastic operation.

Every moving entity obtained cineplastically, whether bloodlessly or operatively, is called a "plastic motor."

Plastic motors are based on the following general principle: In an amputation or disarticulation, actual or antecedent, the tendon and muscle, provided they have the necessary physiological protection—skin, vessels, nerves, etc.—can generally be used in cinematic prosthesis, on condition that the formation of an artificial point of attachment, to be protected in a similar manner, is available. Cinematization can be effected, or prepared, at the time that the primary amputation is made; it can also be done on stumps that have already healed.

Plastic motors may vary as to their number, position, shape, and function.

Without entering into too detailed a description of the numerous varieties of plastic motors, I will limit myself to stating that, at the present day, the most elementary and, up to now, the most commonly used are, as regards shape, the *clava* (*clavus*, a peg) and *ansa* (a loop) motors, and those obtained by means of the canalizing, or tunnelling, of the muscular masses.

As regards number, the motor may be single, double, or multiple; in function it can be either *unimotor* or *plurimotor*.

When the motor is made to execute two opposite movements in succession, it is called *alternative*.

According to the position they occupy, motors are either *terminal*, when placed at the extremity of the stump, or *extraterminal*, should they be placed in the continuity of the stump.

Down to the present time the upper limb has been more frequently cinematized than the lower, but the number of successful cases of cinematization of the lower limbs is daily increasing.

APPLICATION OF THE PRINCIPLES

From what I have said, it will be evident that the application of cinematization entails essentially a radical upheaval of all preconceived notions as to the ordinary methods of amputation.

Principles observed in the performance of amputations according to prosthetic criteria have already caused a revolution in modern surgery, but they must again be subjected to modifications in order to ensure the preservation of the greatest possible amount of the original bone and of the residual motor masses and integuments, for these must be used for the preparation of the plastic motor.

In cases where it is practically impossible to perform primary cinematic plastic operations, as, for instance, at the first-aid dressing stations in the full stress of battle, the surgeon can, at any rate, always so operate as to prepare the ground for a future cinematization of the stump. Skin flaps, muscular insertions, various bone and tendinous fragments and segments of limb, which would seem utterly superfluous under ordinary circumstances for the preparation of ordinary stumps, must be recognized to be of the greatest value in view of the future cineplastics.

In order to prevent the possible loss of these elements and of these materials whilst the stump is undergoing the process of healing, it is advisable to take certain special technical precautions to avoid the retraction of the softer tissues; this ought to be done, however, in such a way as not to hinder the ordinary dressing of the wound.

When the inflammation has decreased, and further complications are no longer to be feared, the time has come for the actual cinematization, that is to say, for the preparation of the plastic motor or motors. A plastic motor, in order to fulfil the purpose with which it is made, must conform to the following requirements:

1. It must possess every requisite for withstanding a firm, resisting, and painless grip, and also a traction force that, in not a few instances, may be high.

2. It must be provided with a sufficient amount of muscle masses capable of functional movement to guarantee the accomplishment of the task that will be demanded of them.

The primary conditions for obtaining the first requisites are:

1. That the motors be covered with skin in perfect condition, well nourished, and possessing a normal degree of sensibility.

2. That, with regard to its shape and dimensions, the motor be of a size suitable for the fastening of the hooks, rings, and rods, that are destined to transmit the functional movement to the artificial limb.

THE "CLAVA" MOTOR

The movement masses must be sought for, and obtained from amongst those which the stump still possesses. Such masses as from their anatomical structure and physiological disposition produce broad, strong, and dissociated contractions, are the best adapted to the task. In the choice and distribution of these masses the fundamental principles of the physiology of movement must be thoroughly observed and respected.

As the tendon is the element best adapted for the transmission of muscular contractions, it should be largely employed for the formation of plastic motors. Should the tendon be missing, the muscles must be utilized either by including muscular bundles

within the terminal motors, or by tunnelling the muscular masses in order to obtain the extraterminal motors.

The antagonistic force, indispensable to all active movement, must be provided either by the stump itself through the formation of two motors with elements belonging to muscular groups of opposite action, or by the artificial limb by means of elastic resistance in the opposite sense to that given by the plastic motor.

With a view to gaining both space and integument it may be advantageous at times to shorten slightly the bone or bones of the stump, and to excise superfluous muscular masses. This, however, can only be done when the bone is sufficiently long to allow it.

In order to provide such material as may be missing *in loco*, recourse may be had to the numerous methods that modern plastic surgery places at our disposal, as, for instance, skin, muscular, aponeurotic or osseous transplantations. Arthroplastics, with the interposition of an aponeurotic flap, may be utilized so as to render mobile those stump segments which, through stiffness and ankylosis, have become unusable. By these same means a new joint can be created in the continuity of the stump, thus giving the plastic motor the power to develop a leverage action.

The cinematization of the thigh stump enables us to solve one of the most difficult prosthetic problems—that of gaining active power over the knee-joint. With the ordinary artificial limbs the knee extension is obtained either by means of springs or of elastics, quite independently of the will of the patient, or else through straps put on the stretch by auxiliary movements of the trunk and shoulder. In some cases we have carried out successful experiments by cinematization of the quadriceps femoris; then the stump itself can control the voluntary extensor movement of the knee, and restrain the flexor movement.

As a result of cinematic plastics we are now able to utilize certain stumps which hitherto have always been held as incapable of functional movement, such as, for instance, carpal stumps, very short stumps, and disarticulation stumps.

The surgeon who, in the case of shoulder disarticulation, succeeds in sparing the deltoid and pectoralis major, in covering these muscles with skin, and in finding means of creating a point of

attachment, may be congratulated on having preserved for the benefit of the mutilated man a precious functional capital.

With regard to the difficult problem of utilizing short forearm or short leg stumps, the solution will be enormously facilitated through the preparation of points of attachment that correspond to the insertion of the biceps and patella tendons.

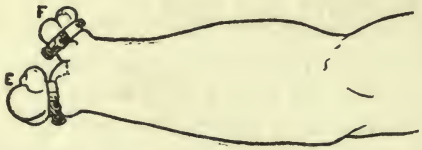


FIG. 1.—Forearm stump. Double terminal *clava* motor. F, Flexor tendons. E, Extensor tendons.

(In order to illustrate the fundamental principles of cineplastics, Professor Putti demonstrated a number of plaster casts of amputated stumps, in which he had prepared different kinds of plastic motors. The first cast was of the stump of a forearm with two terminal motors (Fig. 1); one of these had been formed with the tendons of the flexor muscles, the other with the tendons of the extensor muscles. It was a case of disarticulated wrist, and the stump was already completely healed. After excising about an inch and a half of the radius and of the ulna, two cutaneous flaps were prepared, each of which served to cover the two principal groups of tendons in the forearm, that is to say, the flexor and extensor tendons. Professor Putti thus obtained two plastic motors like clumsy fingers, of which one was controlled by the flexor, the other by the extensor muscles.)

Two points of attachment must be provided in these two "fingers," in such a way as to ensure the transmission of their contractions to the artificial limb, with a view to giving movement to the hand. This I obtained by means of metal rings covered with vulcanized rubber placed at the base of the fingers, and gradually tightened (Fig. 2); to them the artificial motors of the hand were attached. The stump thus became capable of giving flexor or extensor movements to the artificial hand.

In cases in which it is not possible to obtain sufficient material for the construction of two motors, we must limit ourselves to the preparation of a single motor, the antagonistic movement being provided in the artificial limb by a spring or an elastic.

THE "ANSA" MOTOR

Another type of plastic motor is that known as the *ansa* motor. In the case from which the cast exhibited was taken, after shorten-

FIG. 2.—Metal ring covered with rubber for *clava* and *ansa* motors.

ing sufficiently the radius and the ulna, I prepared the tendons of the flexor and extensor muscles, and gathered them together in such a way as to form a ring or loop (Fig. 3), which I afterwards covered with skin. Whenever the disabled man contracts either

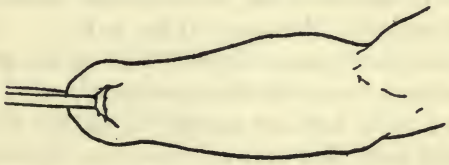


FIG. 3.—Forearm stump. *ansa* motor.

of the two muscular groups, this ring, or loop, displaces itself alternately either in a flexor or in an extensor sense, and the contractions are transmitted to the artificial limb.

The plastic motors so far described are formed of the soft

parts of the stump. In order to give greater consistency to the motors they can be provided with a bony support.

ILLUSTRATIVE CASES

The stump in the first case demonstrated is from a case of disarticulation at the wrist. I formed a para-epiphyseal pseudarthrosis, excising from a third to a fourth of an inch of bone from the shafts of the radius and of the ulna and then interposing a double flap of fascia and of muscle (Fig. 4). I was thus able to obtain an artificial wrist having all the movements with which, normally, the wrist is provided, for the muscles and tendons that cause these movements had been, for the greater part, preserved.

I performed a similar operation on the stump of an arm. Having detached a fragment of bone from the extremity of the humerus at the height of about one inch, I interposed a muscular flap between the severed section of the bone. Thanks to the neo-ar-

FIG. 4.—Forearm stump. Artificial wrist-joint.

throsis, the stump is capable of flexor and extensor movements, for into the piece of severed bone the muscular bodies of the biceps and of the triceps are still inserted (Figs. 5, 6).

I believe that these cases sufficiently show the principal types of terminal motors. As regards their preparation, it is nearly always necessary, as I have said, to sacrifice a certain quantity of the stump's original bone. But plastic motors can be obtained without compromising the length of the bone. This is achieved by directly tunnelling the muscular bodies.

In the forearm stump I prepared the group of the flexor superficialis, preserving its normal cutaneous envelope. By a plastic operation I next covered with skin the space comprised between the superficial flexor and the deep flexor, thus creating a canal

completely lined with skin (Fig. 7). During the period that the wound was healing I maintained this canal open constantly by means of a rubber tube. Once the cutaneous wounds had healed, I inserted a metal rod covered with vulcanized rubber in place of the

FIG. 5.—Arm stump. *Clava* motor with osteal support (artificial neo-arthrosis).

FIG. 6.—Arm stump, same case as Fig. 5, with metal ring in place.

rubber tube. This little rod serves as point of attachment for the cords used to convey movement to the artificial hand (Fig. 8). Following each contraction of the flexor muscles, this small rod displaces itself in a proximal sense, and thus actuates the fingers of the hand.

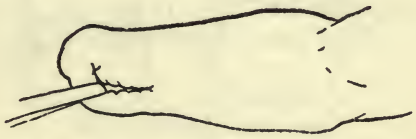


FIG. 7.—Forearm stump. Lateral *ansa* motor.

Arm and thigh stumps are better adapted to this style of cinematization than are those of the forearm. I show casts of two stumps of the lower third of the thigh in which I prepared a canal running horizontally and to the full depth of the quadriceps a

little above its insertion into the patella. Into the canal I introduced a skin flap folded back over itself in such a way that the cutaneous surface was turned towards the lumen of the canal. The tunnel

FIG. 8.—Metal rod covered with vulcanized rubber in use with tunnellized stumps.

thus formed is entirely lined with skin, and can withstand without risk of damage or pain, the presence of the metal rod that serves

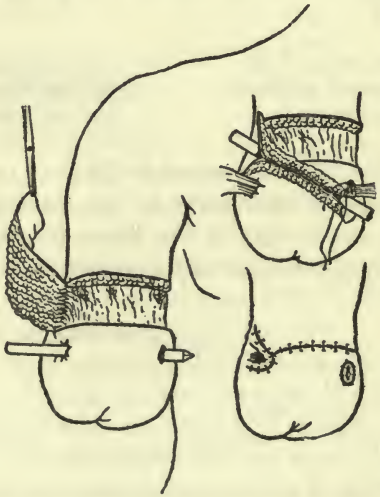


FIG. 9.—Tunnelization of an arm stump with Sauerbruch's method.

for the transmission of the extensor movement to the artificial leg (Figs. 9, 10).

At the first glance it may appear strange that these mechanical

attachments can be so easily tolerated. Experience has proved, however, that if the plastic motor is well placed, if the skin that covers it is healthy, if the wounds are absolutely healed, neither the rings nor the rods cause the slightest harm. When the *clava* motor is sufficiently long, and its head is large enough, the ring surrounding the neck of the *clava* needs not be tightened to such an extent as to interfere with the blood supply of the motor.

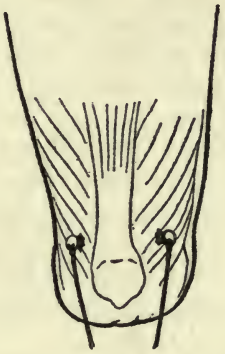


FIG. 10.—Tunnelization of a thigh stump.

Moreover, each ring is provided with a screw by means of which the disabled man can himself regulate the pressure.

The disabled men get so accustomed to the metal rod that they leave it in place even at night. The rod must, however, be removed once every twenty-four hours, in order to clean it with alcohol and oil it with vaseline. I have observed that the skin within the canals gradually acquires the property of throwing off sebaceous substances in greater quantities than normal, thus providing for the oiling of the canal.

FUNCTIONAL RESULTS

Another point deserving consideration is the sensibility of the plastic motors. Professor Amar has made some most interesting physiological researches, showing that the superficial and deep sensibility, and the muscular sense of the stumps, which at first—that is, shortly after the amputation—are greatly altered, not only

recover in time, but eventually attain a degree of sensibility superior to the normal, provided the stump is put through the proper functional training. I have observed that the same thing happens with cinematized stumps. One of my patients, on whom I operated over a year ago, is now able to note with considerable exactitude the difference in the size and weight of the articles which he seizes with his artificial hand.

The functional results that can be obtained from a plastic motor depend upon numerous factors, but especially on the cinematic powers of the muscular masses of the stump, on the manner in which the surgeon has found it possible to utilize them, and on the functional use the motor undergoes. To give a clear conception of the amount of work that a plastic motor can do, I may state that, amongst the cases operated upon by me, the power of the motor ranges from 10 kg.-cm. at the lowest to 100 kg.-cm. at the highest. For a motor to be of practical use it must be contracted not less than one inch. In the case of a hip stump, I have obtained one motor that contracted to the extent of two and one-fifth inches, lifting a weight of 44 lbs.

I have only described the principal types of plastic motors. The genius and the ability of the surgeons will find here a vast field of action. Naturally, it is not possible to treat all amputated stumps in this manner. Those that best lend themselves to it are those that include healthy muscular masses, that retain normal innervation, and that possess an ample contractility. Stumps, with rigid or ankylosed joints, covered over by skin that does not glide easily, being adherent or creased by a scar, do not supply satisfactory plastic motors. The age, and moral and intellectual condition of the patient are also important. The best age is from twenty to thirty years. Disabled men of insufficient mental development, or those who are not likely to be willing to follow with patience and assiduity the necessary functional training of the stump muscles, ought not to be operated upon.

It is to be understood that cinematization does not invariably require operations with the knife. There are stumps already formed which are endowed spontaneously with cinematic resources that, wisely employed, can be utilized for transmitting movement to

the artificial limb. I will content myself with mentioning the wrist and forearm stumps, in which rotary movements are preserved, and the arm and forearm stumps which possess a terminal hood having a development and contractility sufficient to ensure a good grip.

CONSTRUCTION OF SUITABLE ARTIFICIAL LIMBS

Whatever type of plastic motors may be chosen, it is an essential condition for their efficient utilization to their full value that the artificial limb be adapted in a manner suitable to their power, their number, and their shape. This question of cinematic prosthesis is so vast and still so new that it deserves a special study to itself. It is now undergoing gradual development and will bring about a substantial reform in ordinary constructive methods. The surgeon, the physiologist, and the mechanic must all collaborate intimately in this work, as only by means of the perfect fusion of these three can we obtain new methods of a really scientific character that will answer modern requirements and replace the empirical systems which have been followed up to now in the manufacture of artificial limbs.

(Professor Putti demonstrated specimens of artificial limbs especially constructed for cinematized stumps. Among others, three hands, of which two were made for stumps with a single plastic motor: in one the contraction of the motor is used for opening the hand, which was kept closed by means of a spring; in the other, the motor closed the hand. The third hand was made for a stump with a double motor; the movement of closing and opening the fingers was wholly controlled by the two motors. He showed also appliances representing various types of artificial limbs for forearm stumps, and continued as follows):

The construction of the artificial limb is greatly simplified by the possibility of utilizing the intrinsic powers of the stump. The mechanical contrivances hitherto used for moving the fingers are most elementary; the cords, the levers, and the springs used for conveying movement to the hand by utilizing the movements of the elbow and of the shoulder can now be completely done away with, and the disabled man rendered able to open or close the

fingers in any position of the limb. Even workmen's tools can be used in a practical way by the cinematized stump, and a special pincer shaped like a parrot's beak has been devised for the use of workers in metal.

RESULTS

As to the ultimate results of the cineplastic method, no final judgment is as yet possible, for though the idea was conceived over twenty years ago, cinematization has been applied on a larger scale only since the beginning of this war.

The very few cases of operation of this type performed prior to the war—almost exclusively by Italian surgeons—had afforded sufficient proof of the soundness of methods, but they had not provided enough material to enable us to judge with regard to their practical usefulness. Only since the beginning of the war, when the necessity of giving practical aid to the vast and tragic army of disabled men came to the fore, were our surgeons convinced of the expediency of testing the principles and methods of cinematic surgery. We are yet at the very beginning of this new scientific movement, and the surgeons of all allied nations have not as yet contributed to it.

The German surgeons have followed Sauerbruch's example, and, although they have created an admirable scientific organization, they have limited themselves to the repetition of a single type of plastic motor. Consequently, in analysing the results obtained by them, we can form but a partial judgment of the practical value of cinematization. The number of operations performed by Italian surgeons is probably inferior to those done in Germany, but the variety of the motors experimented upon by us is certainly greater.

It is easily understood that, for the moment, it would be impossible to make a synthesis of such a variety of facts. I therefore believe that it will prove of greater benefit, in discussing the results that have been obtained through cinematization, to consider the question solely and exclusively from the point of view of my own cases.

These number about fifty examples of cinematization of the

upper and lower limbs, either primary or secondary; plastic motors of various types were formed, and in each case an artificial limb was applied. The functional value of the motors was studied by dynamographic and dynamometric methods, whilst their practical capacity was tested in the actual use of the artificial limb.

At the Instituto Rizzoli I have at my disposal a large workshop for the construction of artificial limbs, so that I have been enabled to study cinematic prosthesis as well; this, as I have already said, constitutes one of the most important sides of this complex question.

CONCLUSIONS

The researches that have been made in the Institute have brought me to the following conclusions:

1. The practical results that have been obtained through cinematization have convinced me that the hopes aroused by the principles and methods of the modern theory of plastic motors are thoroughly well grounded. Cinematic plastics are entitled to be placed amongst the most brilliant of the discoveries of orthopedic surgery, deserve to be accepted with perfect confidence, and to be tested on a large scale by all those whose aim it is to restore to the disabled man his functional activity.

2. The preparation of plastic motors is a well-defined surgical act that must be performed in accordance with its own special methods, which have already stood the test of experience.

3. From a physiological point of view plastic motors have been proved capable of giving both the quality and quantity of action of which the muscular masses that stimulate the said motors are capable. Yet, practically considered, plastic motors will yield the full measure of their value only if the artificial limb is perfectly adapted to their shape and their strength.

4. As the principal aim of cinematization is to attain the vitalization of the artificial limb, it is essential that the surgeon and the artificial limb maker should work in harmony, in order to solve satisfactorily this most interesting but difficult problem.

Chapter VII

THE CARE OF CRIPPLES AND ORTHOPEDIC SURGERY IN ITALY

THE interest of the Italian public in the misery of cripples, for the first time took practical form in 1839 by the foundation of an orthopedic institute in Florence, through the initiative of Prof. Ferdinando Carbonai, who planned and managed it entirely on the lines of a modern institute of orthopedics, as understood at that early time.

Before this undertaking, little or nothing had been done in Italy for the unfortunate beings, beyond their admission to hospitals and asylums for the poor, where they were merely fed, or, in rare cases of deformities, treated with negative results in public hospitals.

In extenuation of this lack of interest of the Italian public for these unfortunate children, mention should be made here of the foundation of "The Seaside Sanitariums and Mountain Stations" which were solely an Italian institution, copied afterward by all other nations.

The original idea of such institutions was due to the propaganda of another Florentine, Dr. Barellai, who in 1853 succeeded in convincing the city of Florence of the high value of such a project.

At first a small number of children were sent to the seashore without special arrangements for their housing; later on, a sanitarium for over 100 children was

Prof. Alessandro Codivilla, Bologna.

founded in Viareggio, on the coast of Tuscany. Soon after, other sanitariums were established on the Riviera and on the coast of the Adriatic.

At present, there are a number of such institutions, and each province of Italy has its own, where children afflicted with rachitis, tuberculosis and bone deformities can be sent.

The great advantage of such treatment was so highly appreciated that the time was extended and plans for transforming these sanitariums into permanent hospitals are under consideration. In fact, an attempt has already been made in the case of the seaside hospital at Palermo, founded by the late Enrico Albanese, surgeon professor. It was first started as a seaside sanitarium in 1874, and later turned into a pediatric hospital with special wards for orthopedic surgery and physical treatment. In 1880 it accommodated 55 children. Lately, it has been enlarged and considerably improved. At present the surgical, orthopedic, kinesitherapic treatment is excellent, due to the hygienic conditions, the ocean air, the climate, the sea salt and the sun baths, which give the best possible results in rachitics and cripples in general.

Returning to the first Orthopedic Institute of Florence, founded by Prof. Ferdinando Carbonai, it is to be noticed that it was modelled on the plan of the Pravaz Institute of Lyons. Originally it was built for 30 patients. Later on it was enlarged, treating deformities mainly with gymnastics and hydrotherapic-kinesitherapic methods and resorting at times to tenotomies, myotomies, gradual redressments, and applications of orthopedic apparatus made in the institution.

The result from this hygienic, medical and orthopedic method of treatment was so excellent, that the Institute, originally built for well-to-do classes, became later on accessible also to poorer patients, and an orthopedic clinic was opened by the Tuscan Government for the benefit of medical students.

The patients received a limited elementary instruction—according to their physical capacity and endurance, and, as shown by the *Archives*, the results were excellent up to the close of the institution upon the death of Professor Carbonai in 1888.

Following the establishment of this school in Florence, another, the real first public school for crippled children, was founded in 1872 in Turin. This gave shelter to boys excluded from the public schools. It was founded by Count Riccardi di Netro, who, having at that time charge of public education of the city, had the opportunity of observing that the unfortunate cripples, excluded from public schools, were running about the streets without the benefit of education or training in some kind of useful handicraft.

The first class for crippled children was attended by twenty-two children between four and seven years of age. From among the applicants, those children were selected who had already passed through the period of softening of the skeleton and whose bones had been consolidated. The children received sufficient teaching in that class.

Medically, the class was under the supervision of Professor Gamba, who, conscious of the importance of gymnastics and hygienic care and surroundings for crippled children, put them in the first place for treat-

ment, so that, besides an invigorating diet and tonics, electrotherapy and hydrotherapy were applied.

The favorable results of this first experiment led to the foundation of a *charity union* to further develop and improve other schools of the same type. Within a short time, four more schools were opened in the town districts mainly populated by the working classes.

From the reports of Professor Gamba to the Royal Medical Society of Turin we learn that during the eleven years, since the foundation of the first school for crippled children, 1,600 children suffering from rickets had been treated and 850 cured or sufficiently improved so as to be able to attend the municipal schools or to take up some handicraft or trade. From the report[1] it can be seen that 3,286 crippled children were treated. The majority of these, on leaving the school, were able to earn a living, that is, were capable of earning their daily bread. For the rest, the Charitable Society had provided in some other way, training them for such handicraft or occupation as was best adapted to their individual intelligence, physical strength or inclination.[2]

In 1886 a branch for crippled children was added to the school; also a dispensary, where surgical treatment was given to special cases in need of intervention without charge. An average of 100 crippled children attended annually.

At present the conditions are much improved as the Institute has three new, large wards, with a gymnasium,

[1]Istituto dei Rachitici di Torino, Assemblea Generale dei Benefattori. Torino, 1892, 1897.

[2]G. Pini. La Scuola dei Rachitici in Italia. Milano, 1848.

a recreation hall and a garden, sheltering annually more than 200 children between the ages of four and seven, with an added daily attendance of about 130.

The children are brought to school in special omnibuses which pick them up around the city at 8 a.m. and send them back home at 5 p.m. They are fed twice a day with good food, and in some cases administered with some tonic or cod-liver oil, according to medical indication.

The children are given a bath twice a week, and a specially trained teacher instructs them in proper gymnastic exercises under the supervision of a physician, who pays daily visits to the different sections. At the end of every three months the physician records the changes in the general condition of each child, registering the weight, the height and any special symptom worthy of notice.

During the summer the children are taken to two country homes belonging to the institution, where they can live in the open air amidst favorable hygienic surroundings, and by the end of August a selection is made of those dismissable on account of their age or because they are cured, improved to the limit, or incurable.

Usually these children attend the school for three years, and during that time, if necessary, are transferred to the sick ward for treatment.

This clinic accepts children between three and fifteen years of age who suffer from diseases of an orthopedic nature. Treatment is free for the poor of Turin, and the other patients pay from 20 to 80 *lire* a month. This department can at present accommodate 50 patients.

Three hundred patients were examined in the dispensary during the first year of its existence, and 2,390 in 1907. This institute for crippled children progresses constantly and enjoys the greatest sympathy of the population. Two pavilions have been added to the buildings, and a third one containing plans and installation for gymnastics and hydrotherapy is under construction.

THE INSTITUTION FOR CRIPPLES AT MILAN

The noble initiative of Turin was followed by many other Italian cities, the first being Milan in 1875, founded at the suggestion of Dr. G. Pini[1] on the same lines as the school at Turin.

According to Dr. Pini the purpose of the asylum was to bring crippled children to a health center for a few hours daily, in order to benefit them by gymnastic exercises, hydrotherapic treatment and needed medications. He planned to improve their physical condition, and at the same time teach them, in practical schools, such subjects as would be of importance to them in their future life.

The first endowment fund was given as far back as 1850 by Marchese Visconti, for the construction of an orthopedic hospital for crippled children. Later on, a well-equipped ambulatory and clinic was founded so as properly to provide for the increasing attendance of patients, which in the eight years, from 1875 to 1883, reached 3,276.[2]

Thus originated in 1874 the "Istituto dei Rachitici"

[1] La Scuola e gli Istituti dei Rachitici in Italia. Milano, 1848.
[2] G. Pini. *loc. cit.*

of Milan, founded by Dr. Gaetano Pini, for three special purposes: First, to prevent the spread of the disease, by proper advice, better food, prophylactic treatment, and other means necessary to fight the causes of the disease; second, to supply medical and surgical treatment to combat the disease; third, to establish proper schools for the alleviation of the consequences of the disease.

The school, the ambulatory, the clinic and hospital were built originally where the center of the great institute stands at present. The main building was erected in 1881, but has been greatly enlarged, and special wards, operating rooms, halls for gymnastics and hydrotherapy are in full working order, besides an isolation pavilion. It accepts children when eighteen months old, at a stage when the process is yet active and the consolidation of bones is not complete, thus giving more opportunity to prevent deformities. This policy made it necessary to enlarge the institution, under the guidance of the late Professor Panzeri, and later on by Dr. Galeazzi the present director, who improved and perfected it, according to the latest scientific requirements.

About 100 non-paying and 50 paying patients are admitted in the new wards, which are provided with all the necessary apparatus for careful examination and thorough cleansing of each patient before admission.

Furthermore, the establishment was provided with a new operating room, a chamber for electrotherapeutic diagnosis, a hall for hydrotherapy, mechanotherapy, with Herz's, Zander's and Krukenberg's apparatus, a special massage room, a section for the treatment of

Orthopedic Clinic at Milan.

deformities of the trunk, most of the work being done with Schulthess' apparatus. A department for physical education is also attached. It is further provided with scientific laboratories, radioscopic cabinets, rooms for dissecting and for histopathological researches.

Particular attention is given to prophylaxis, and early cases are preferred between the ages of two and five with the object of preventing rachitic deformities. Lately a working department has been added for educating the inmates in some useful calling best adapted to their individual condition.

THE INSTITUTION FOR CRIPPLED CHILDREN AT GENOA

Genoa, also, following the example of Turin and Milan, opened a school for crippled children in 1878. This gradually improved until at present a new building divided into three pavilions has been erected in an attractive location whence a wonderful view of the gulf can be enjoyed. It is particularly intended for children in need of prophylactic and corrective treatment.

In Genoa the patients have the great advantage of the sea-bathing cure, combined, since 1899, with that of high mountains for a month, and the sea resort for another, with satisfactory results.

Mantua followed Genoa with a modest institute until 1899. Then under the skillful direction of two well-known physicians, Dr. Allessandrini and Dr. Zoppi, it began to develop and progress, attaining the highest reputation. The institution now shelters about 200 children, with remarkable hygienic and clinical results.

THE INSTITUTE AT CREMONA

Cremona, in 1881, opened an institute for crippled children consisting of a school and ambulatory clinic. Later on, it was annexed to the Children's Hospital, and has become a model of its kind.

THE INSTITUTE AT BERGAMO

Thanks to the spirit, the energy and constancy of the present director, Dr. Rota, the institute at Bergamo, founded in 1884, has become of as great importance as that at Milan, of which it is an imitation so far as construction and equipment are concerned.

The school, the asylum and the dispensary were opened first; the wards were added in 1887 (three years after).

During the last twenty years it has been frequented by 1,445 crippled children for treatment and training, and the ambulatory clinic examined and advised 9,896 patients, of which number 1,597 were admitted to the ward for orthopedic treatment and operations.

Just now it is again undergoing great alterations, new buildings are being erected and the old ones enlarged. This will enable it to admit still more patients and to give them the very best surgical treatment. The site of the institute could not have been located in more hygienic and attractive surroundings.

THE INSTITUTE AT BRESCIA

The institute for crippled children at Brescia was planned as early as 1882 but for economic reasons did not materialize until 1894. But since then it has been a model of its kind, by reason of its schools, dispensary

Panoramic View of the Rizzoli Orthopedic Institute at Bologna.

for gymnastics, massage, electrotherapy, accurate examinations, operations and applications of apparatus for correction of deformities. The results have been truly remarkable, about one-third of the children being annually discharged as completely cured and able, thereafter, to attend public schools.

ORTHOPEDIC INSTITUTE AT BOLOGNA

Mention has been made before of the "Tuscan Orthopedic Institute" founded and directed by Prof. Ferdinando Carbonai in Florence, in 1842.,[1] which, for lack of support, practically became extinct in 1888, with the founder's death. But while the Tuscan institute was dying in Florence for lack of support, a new one was founded in Bologna through the generous donation of the entire fortune of Francesco Rizzoli, the famous professor of the surgical clinic at the University of Bologna.

In accordance with the wish of the benefactor, the institution was to be located in the former Monastery of the Olivetan Monks, on the hill of San Michele in Bosco, overlooking the city. Professor Rizzoli bought the site for that purpose in 1880.

The institute was to be built and fitted out, so that it could serve the following noble intentions: First, the advancement of science; second, the benefit to humanity; third, the benefit and honor to the country.

An old historical structure was chosen for the realization of Professor Rizzoli's widely conceived plans, a large famous building, which, properly restored, would

[1] Carbonai, Cresci, Il R. Istituto Ortopedico—Idroterapico di Firenze e le deformitá in esso curate.

serve his philanthropic purpose, and be preserved at the same time as an historical monument. It required about fifteen years to complete the task, at the expense of 1,400,000 *lire*, for the restoration, adaptation and equipment of the quarters alone.

It was due to the favorable conditions of the old building, and the excellent talent for organization of the first director, Panzeri, that the choice of this beautiful cloister was satisfactory in every respect. One gets the impression that in a newly erected building, such extravagantly large rooms could never have been provided.

It may suffice to point out that although fitted out for only 150 beds, it occupies an area of 13,150 sq. m., the greatest part consisting of wide corridors and splendid halls, where the patients take their walking exercises.

One of the largest halls in Italy—162,26 m. long—is on the first floor. On the main floor there is a hall 250 m. wide, which, in winter, can be closed with glass windows and doors and heated so that the patients can walk and rest in it unaffected by the outside temperature.

In the other quarters, there are wards and rooms for paying patients, and for the cleansing of newcomers; halls for gymnastics and mechanotherapy, for hydrotherapy and electrotherapy; the scientific laboratories; the library; the museum; and the orthopedic work shops.

The surgical department is large and contains several bandaging rooms, rooms for the fitting of orthopedic apparatus and for examinations. Furthermore, there

Doorway of Rizzoli's Orthopedic Institute; Victor Emanuel III standing beside Prof. Vittorio Putti.

are the dining halls for the patients of various groups, conversation and reading rooms, library, music and billiard rooms, and a hall for skating.

It enjoys a wonderful hygienic situation. Located on a hill south of Bologna, a very short distance from the city, it offers the most beautiful view over the city and the surrounding hills covered with rich vegetation and attractive suburban homes. It has large shady gardens of an area of 55,000 sq. m. on the slopes and on the plains, which provide recreation for the patients. It also owns a dispensary in the city, where applicants are examined, and are given surgical and kinesitherapeutic treatment.

The institute possesses appliances for treatment of deformities in the widest sense of the word: First, all the hygienic appliances which assist in the treatment of the deformities and check their further progress; second, numerous apparatus for therapeutic purposes, forming one of the greatest collections of modern appliances of that kind, making possible and facilitating the treatment of all sorts of deformities and diseases of the limbs.

Aside from a complete outfit of Zander's apparatus for the correction of deformities, and Schulthess' outfit for treatment of scoliosis, the institute has also a large number of other valuable appliances, many of which are manufactured in the workshops of the institute by skillful mechanics, under the supervision of the physicians.

In this way, every kind of hygienic, gymnastic, compensatory movement is supplied so that anatomic deformities and functional anomalies can be treated

with every variety of modern appliances imaginable. The best machinery for hydrotherapy and electrotherapy has been installed, and any new device can be made in the workshop. The equipment of scientific and radiologic laboratories is perfect, continually augmented with new discoveries.

The surgical operations are performed by Prof. Vittorio Putti, assisted by two chief surgeons, two permanent assistants and a number of volunteers, beside a number of post-graduate students who regularly frequent the institute for special training in orthopedic surgery.

The poor patients of the province of Bologna are entitled to free treatment and attendance. They occupy about one-third of the 150 beds of the hospital, the rest being reserved for paying patients. A large number of the latter, however, pay only part of their board.

The running expenses are covered partly by the income from the endowment of 1,700,000 *lire*, left by Professor Rizzoli, and partly by the contributions from paying patients. The expenses, which during the first years (1897-1899) averaged 50,000 *lire*, during successive years reached 170,000 *lire*. Up to 1909, 3,600 patients were treated from all the provinces of Italy, and some also from foreign countries.

The charity patients furnish the amount of material for teaching purposes, and the State provides for the support of the University Clinic, securing the patients from the other hospitals and all the material necessary for instruction of the students.

A prize of 3,500 *lire* has been donated by the province in honor of the late King Umberto. This international

Prof. Vittorio Putti, Bologna.

prize is awarded every fifth year for the best paper on or invention in orthopedics.

In 1905 the prize was given to Prof. Oscar Vulpius for his monograph on tendon transplantation. The members of the institute are excluded from competition, and the committee for awarding the prize is selected from the medical faculties of the country.

ORTHOPEDIC INSTITUTE OF NAPLES

The Orthopedic Institute of Naples was founded in 1900, with the endowment of the late Duchess Ravaschieri. It has: (1) A dispensary where poor cripples from the surrounding country are examined and treated with gymnastic exercises, massage and minor operations, etc. (2) A charity ward on the first floor, consisting of four large, well-equipped rooms for children and adults of both sexes. (3) A ward on the second floor, for paying patients of the second class. (4) A small isolated ward for paying patients of the first class.

The following departments are available for treatment: (1) A surgical operating room, with annex. (2) A kinesitherapy hall which occupies the main part of the building, with 350 sq. m. of area, with appliances for active and passive movements—Zander's, Knoke-Dressler's, Beely's, Lorenz's, and Stillman's. This department has likewise rooms for special manual massage given by the physicians, as well as dressing rooms and suitable apartments for the attendants. (3) A hydrotherapy department with two large bath rooms, a room for shower baths of various systems and a dressing room. (4) Electrotherapy, with static,

galvanic, faradic currents, electric massage, hydro-electric and radiotherapeutic baths, occupies another special hall. Scientific laboratories for chemical, macroscopic and microscopic analysis, and for radioscopy and photography occupy other rooms. (6) Finally an orthopedic workshop is connected with the institute. In July, 1906, a seaside sanitarium was added to it, located on the beautiful beach of Bagnoli nearby.

The quarters of the sanitarium are splendidly located, directly on the ocean; they are sunny, well ventilated, and surrounded by a very attractive park. On the ground floor, there are a waiting room for visitors, sleeping quarters for the boys, and rooms for examinations and dressing. The second floor is occupied by the sleeping quarters for the girls and for the nurses, with a special class room and large parlor for the latter.

Of late years the institute for crippled children at Naples has been greatly improved and enlarged and with its excellent hygienic conditions gives equally excellent results.

Schools or institutions for crippled children connected with dispensaries, but without special wards, exist also in many other cities of Italy, but although the results of special treatments given to the crippled in these are favorable, yet mention cannot be made of such here, where only real organized institutes are reviewed.

Some of the institutes for crippled children mentioned above, should more correctly be called orthopedic, especially that of Milan, one of the most complete of its kind. Yet they all retain the name of "Institutes for Crippled Children," perhaps on account of their origin. Others, however, were founded originally with the idea

of treating not only rachitic cases, but also deformities in the broadest sense of the word.

By the foundation of schools for crippled children an important step was taken for the future of young cripples by saving them from physical and intellectual decay, and giving them the opportunity of earning a decent living.

Schools for the professional training of cripples, under strict individual system, according to intellectual and physical capacity, as adopted in Germany, Denmark and elsewhere, have not yet found great sympathy in Italy.

More liberal and broader ideas were favored, and as early as 1877, at the Congress of the Italian Medical Societies, the following resolutions were adopted:

> The Congress requests that professional schools be founded for crippled children whose deformities cannot be corrected in these schools. Those children should be taught such arts or crafts as they can perform without the exertion which would further imperil their bony structure and with it their general condition.

A further warm appeal was made by Professor Codivilla in 1905, advising the founding of such schools as were already working favorably in Germany, Austria, Denmark, Sweden and Russia, where cripples were trained according to their physical possibilities and intelligence, which might be directed to the performance of work adapted to individual cases.

At the same time a report was presented by Professor Galeazzi to the Fourth International Congress, for private and public treatment of such patients (Milan, May 23–27, 1906).

In that report Professor Galeazzi appeals to the state, county and town authorities and to all charity organizations as well as insurance companies for their moral and financial support of schools and workshops for cripples and the injured.

This appeal was not in vain, and thanks to the munificence of the president of the institute for cripples in Milan, Signor Carmine, the first workshop for crippled children was founded and was joined to the institute for rachitics. The idea of combining the school with the institute was a fortunate one, for the pupils of the school can profit by the outfit of the institute.

Only cripples, and patients paralyzed or injured, whose physical and intellectual powers will enable them to profit by the attendance are admitted. They do not remain in the school after their training is completed except in case of those who are able and willing to devote themselves to teaching.[1]

In the neighbourhood of Milan, an asylum, endowed by Ottolenghi-Finzi has been erected for cripples entirely unable to work. This asylum receives those cripples who, on leaving school, can neither find an occupation nor return to their families, or those who through sickness or accidents are unable to work. It is located in the country, where the inmates can be employed in farming or can apply themselves to some light work adapted to their condition.

The women do all the menial work—washing, ironing, sewing of all sorts; help to make orthopedic corsets

[1] G. Pini. Le Scuole e gli Istituti per I Rachitici in Italia. Milano, 1873.—Carmine. Le scuole e le case di lavoro per gli storpi ed i mutilati, Nuova Antologia di scienze lettere ed arti. Maggio e Giugno, 1908, 16.

and leather goods; while the men do tailoring, shoemaking and mending, when necessary.

The practical results of these institutions are truly remarkable, and it is to be hoped that other cities of Italy will follow the example of Milan, and that the state and other public authorities will normally encourage and materially support them in their endeavor to alleviate this social misery.

Much has been done in Italy for the crippled and deformed, and we note with satisfaction that the schools, the workshops and the entire system are being continually perfected, so that Italy can proudly take her place among the most civilized countries for her progress and advancement in this line of philanthropy.

Chapter VIII

MODERN SURGERY IN ITALY

MODERN surgery in Italy, as in other countries, is not considered simply a gift of a skillful artist, endowed with a good knowledge of anatomy. The real surgeon, today, must have, beside skill and ability, a full medical education, good training in physiology, anatomy, biology, and in general and special pathology before he undertakes the practice of a profession so full of responsibilities and criticism.

Excellent operating technique cannot alone justify a surgeon's work, which has to be supported by a conscientious diagnosis, based upon all the positive investigations which science has placed at his disposal. In a few words, the art, skill, and daring which would have made the reputation of a surgeon in the last century, would not count for very much today.

The "Errores Medicorum Terra Tegit" would no longer justify mistakes, since a more educated public expects from the man of science an accurate diagnosis, a correct and clear technical procedure, and a positive prognosis in which art and skill play very little part.

In Italy surgery has made rapid progress of late, attracting the attention of the outer world more and more; hence it was with surprise, indeed, after the high praises paid to the Italian surgeons by most of the foreign colleagues, that we read the denunciatory

comments of one of them, Sir Rickman John Godlee, Bart., in his volume on Lord Lister:[1]

In Italy all surgical reform was slow and the adoption of antiseptics was belated. Writing in 1878, Dr. Giuseppe Ruggi of Bologna, said: "Italy is the most indifferent of all nations, and seems as if she neither interested herself nor wished to interest herself in this method of treatment which has been estimated so highly by the great surgical leaders of Germany."

He mentions seven Italian surgeons as the only rare exceptions who had at least given it a trial. One of these, Bottini of Pavia, who was highly successful amidst disgustingly insanitary surroundings, speaks in 1878 of the general acceptance in other countries after some systematic opposition, whilst in Italy, he adds, the doctrine "has been suffocated, up to that time, by the terrible insidious weapon, apathy."

Another Italian surgeon, De Vecchi of Turin, in the same year, urges his compatriots, if not to adopt, at least to experiment with a method now pronounced to be good by the mature experience of other countries.[2]

Far away in the South, Albanese of Palermo met with some success in his wild practice, which, owing to a prevalence of brigandage and the thirst for vendetta, was like military surgery on a small scale. But no Italian surgeon, as far as is known, entered in the same way into Lister's life, either by personal intercourse or by correspondence, as those in the other countries which have been mentioned. Italy, therefore, needs no further mention, and the same may be said of the Iberian peninsula.

I wish to repeat and point out that this volume on Lister by Sir Rickman Godlee was published in the year 1917, when the Italian surgeons had already given good account of themselves in the war and many English surgeons, who had had the opportunity of

[1] London, 1917, 356.

[2] Doctor P. De Vecchi, Contribuzione allo studio della medicazione antisettica del Lister. Torino, Rouz e Favale, 1878.

inspecting the splendid organization of the Army Medical Corps and of the Italian Red Cross, had expressed themselves in the highest terms of admiration, not only on account of the indisputable efficiency of the Italian surgeons, but also on account of the splendid organization of those "disgustingly insanitary surroundings" which he mentions. As for the brigands of Sicily, they have proved to be among the best soldiers Italy had at the front.

Sir Rickman Godlee, in his book accuses the Italian surgeons of apathy, but he confesses that Lister had to leave Glasgow, and successively Edinburgh, coming to London, before his own English colleagues would adopt his systematic method, which was bitterly criticized and even ridiculed all over the British Isles. If the learned writer would have taken the trouble to consult the voluminous literature on the subject, published after the date of my pamphlet (1878), he would not have indulged in such expressions against a respectable body of professional men, as the Italian surgeons are and have been for a great many years.

But to return to the purpose of this work, I can say that Lister's method was soon adopted in all Italian clinics, and successfully in some of the hospitals which were so "disgustingly insanitary."

Durante in Rome; D'Antona in Naples; Tricomi and Parlavecchio in Palermo; Clementi in Catania; De Paoli in Perugia; Novaro in Genoa; Carle in Turin; Mangiagalli and Galeazzi in Milan; Tansini in Pavia; Bassini in Padua; Tusini in Parma; Donati in Modena; Ruggi, Nigrisoli, Monari, Calabrese, Putti, Poggi, in Bologna—all these well-known professors, well-known

surgeons, highly appreciated contributors to surgical study and work, adopted the Lister method at first and followed all the modifications and improvements which were incorporated afterward.

Extensive literary contributions on this great work of Italian surgeons have appeared in many foreign medical journals and magazines and could not have escaped an impartial observer and conscientious student of the present condition of surgical progress. But Italy has been sadly neglected, and her share in the world's efforts toward a further advancement in every branch of study has not been recognized, nay, has been almost ignored.

Her efficiency during the war could not be the effort of the moment; it must have been the result of a long preparation, of study and work of many years past, when the Italian school of surgery began to understand the importance of its intimate association with the school of medicine.

Laboratory experimental work, pathological researches, and differential investigations which lead to proper and correct diagnoses are only possible when medical and surgical clinics work together. Italy has been fortunate in having, during the second half of the last century, some of the most learned men at the head of her medical clinics—such men as Guido Baccelli of Rome; Enrico de Renzi and Antonio Caldarelli of Naples; Edoardo Maragliano of Genoa; Camillo Bozzolo of Turin; Carlo Forlanini of Pavia with his successor Eugenio Morelli; Achille de Giovanni of Padua; Augusto Murri of Bologna; Pietro Grocco of Florence, and several of their pupils who are following

at present in the glorious steps of their masters. The influence which those great teachers had, and still have, over general medical and surgical research has been, and is yet, remarkable.

It reminds us of the period of the Renaissance and of the large advances in surgery in Italy during the latter half of the sixteenth century. Vesalius, Falloppio, Ingrassia, Fabricius, Bottallo, Maggi, and later, Cesare Magati, were all profound students of the human body, and deep investigators of human nature, as far as the times permitted them to be, before they claimed surgical supremacy.

The war has been a revelation of a new Italy to many foreign nations, but, to her great advantage, she has also been a revelation to herself. The necessity brought together many Italians of different provinces, heretofore unknown to each other, giving them a chance to appreciate the scientific value of their countrymen, so that in their own minds the importance of their home scientific standard of medical and surgical education was greatly raised.

Chapter IX

PRACTICAL SURGERY

THE fact that the history of modern surgery in Italy has been written here only in connection with the universities, schools and clinics does not mean that surgery, in Italy, is confined only to such bureaucratic centers. On the contrary, there are in each of the one hundred large and small cities of Italy several institutions or hospitals directed by some of the best pupils of the universities' clinics, who did not follow the professorship career, but went into private practice and eventually, through their professional merits, were selected to head the provincial, municipal or private institutions, some of which are well worth the reputation they have acquired as first class scientific centers.

Some of these institutions, supported by old endowments, private contributions, donations from provinces and municipalities, are well equipped with all the modern conveniences for up-to-date treatment, being furnished with pathological laboratories, radioscopic and hydrotherapeutic apparatus, even publishing a monthly report (*Archivio di Scienza Ospedaliera*) which is afterward referred to in the general *National Report of the Hospitals*[1].

These institutions are not confined only to big cities like Rome, Turin, Milan, Bologna, Genoa, Venice,

[1] Atti dell'associazione Italiana dei Direttori degli Ospedali.

Naples, Florence, Palermo, Catania, Padua, Trento, Trieste, but are also found in smaller ones like Mantova, Ferrara, Modena, Parma, Brescia, Casale, Alessandria, Asti, Savona, Livorno, Pisa, Siena, Perugia, Foggia, Cosenza, Macerata, Bari, Lecce, Reggio, Brindisi, Taranto, and in many others provided with hospitals, where thousands of operations are performed daily by skillful surgeons whose fame often goes beyond national recognition.

In this connection we would mention the names of: Giuliano Vanghetti, a physician (of the little town of Empoli) of whom mention is made at length, in other parts of this book, about his important work on cinematic amputations; Flavio Valerani, director of the hospital at Casale, a little town in the north of Italy, where he distinguished himself for his original work, skillful surgery and abundant contributions to surgical literature of the highest scientific value; Giovanni Fiorani, whose reputation was beyond national boundary for his scientific surgery in the hospital at Bergamo. One of the most celebrated surgeons of the middle of last century, B. Larghi, performed the most daring and wonderful operations, before Lister's method made it safe to tackle almost any organ of the body, contributing an extensive literature on almost every subject of surgery, on the progress of science and technique. Edoardo Bassini wrote his excellent work on surgical anatomy, and his particular study of the inguinal canal in the modest dissecting room of a provincial hospital, leaving his name famous for a special method of operating for inguinal hernia. Enrico Bottini's surgery of the neck is only second to that of his friend, Kocher, and his

statistics on thyroid operations equalled those of his rival in that particular disease. Porro, Mangiagalli, Calderini, Ruggi, and Bozzi are well known for their original operations on the uterus and its appendages, and Farina is known for being the first to operate upon a wounded heart. No foreign surgeon who has visited Venice ignores Dr. Davide Giordano, director of the Ospedale Maggiore, author of a large compendium on "Italian Operative Surgery," who excels among the surgeons of Italy of today. The lovers of surgical literature must be familiar with the original work of A. Boari, surgeon in chief of the hospital at Ancona, who devised the most clever operation on the ureters and invented a special anastomotic button (1899), or with the unique case of interilio-abdominal disarticulation by Cacciopoli (1894).

The list would be too long to review the many other valuable contributions to the progress of surgery by officially unknown surgeons, who modestly work in small centers with the only incentive of personal ambition and pride.

Beside the regular surgical clinical sections, there are also flourishing several scientific and practical centers dealing with all the branches of special regional surgery. Very active, for instance, are the clinic and special sections of otorhinolaryngology, under the direction of Giuseppe Gradenigo, at present professor at the University of Naples; of Ignazio Dionisio at Turin; of Camillo Poli and Giulio Masini at Genoa; of Gherardo Ferreri at Rome; and of Vittorio Grazzi at Pisa, all of whom contributed largely to the treatment of special diseases.

Special mention must be made of Giuseppe Graden-

igo's recent studies on psychophysiology in relation to aviation. He inaugurated in Rome the "International Sanitary Congress for Aviation."

The gynecologic institutes have also attracted special attention, thanks to the activity of Senator Luigi Mangiagalli of Milan; Ernesto Pestalozza of Rome; the late Luigi Bossi of Genoa; of Ersilio Ferroni of Florence; Innocente Clivio of Pavia and Giovanni Miranda of Naples.

In Turin, the Ospedale Maria Vittoria has an able surgeon in Libero Bergesio who specializes in gynecology, in which the celebrated surgeon, Antonio Carle, has invaded the field with that ability which characterizes his great work.

Chapter X

UNIVERSITIES IN ITALY

THE university, in its earliest conception, was a scholastic guild, a gathering of groups of men, anxious to learn, around other men disposed to impart to them their personal knowledge and experience. These groups of independent teachers and pupils, in the course of time, were obliged to organize for mutual protection and for a public legal recognition of their rights and of their duties. From that time, universities became well-established organizations placed under the protection of the laws and under special rules set by the government of their own countries.

The privilege of granting rights to a university and to establishing certain rules under which the institution should be administered, was assumed by emperors, kings, popes, princes, the exclusive rulers of the various countries in medieval times. The first institution of that kind in Italy (and perhaps in the world) dates from the ninth century, when the School of Salerno is mentioned as the first center of medical studies.

It is not the purpose of this work to review the history of surgery taught in the various universities organized throughout Italy after that of Salerno, for numerous writers in England, Germany, France and Italy have amply dealt with the subject, but particular mention should be made of Dr. James J. Walsh of Fordham University, New York, who published only a few years

ago the interesting volume "Old Time Makers of Medicine"[1]; and of two of the most prolific writers of Italy on that subject during the last century—Dr. Salvatore de Renzi of Naples in his "Storia della Medicina in Italia" (Napoli, 1844) in five volumes, and Dr. Francesco Puccinotti of Urbino, in his "Storia della Medicina," also in five volumes.

Italy, from the tenth to the fifteenth centuries, was the center of the medical studies of the world, and that long period of time was also the most flourishing for the Italian Universities of Bologna, Reggio, Modena, Vicenza, Padua, Naples, Piacenza, Vercelli, Arezzo, Rome, Perugia, Treviso, Pisa, Florence, Siena, Lucca, Pavia, Ferrara and Verona, and later of Turin, Mondovi and Chieri.

Lewis Stephen Pilcher, the eminent surgeon of Brooklyn, editor of *Annals of Surgery*, wrote an interesting article "The Mondino Myth" which was published in the *Medical Library and Historical Journal.*[2] With the kind permission of the author I give some extracts from his lecture, which describes so well the conditions of the medical schools of that time.

To a physician who is at all interested in the history of the development of medicine, the old Italian universities will ever afford a most interesting field of study and regard. The heroic age in medicine was lived beneath Italian skies.

How many of the men who were the creators of medical learning lived in Italian cities? In Padua, Vesalius, Colombo, and Fabricius ab Aquapendente taught; Harvey studied; and Galileo, after he had exchanged Hippocrates and Galen for Euclid and Archimedes, carried on his researches into the constitution of the Universe.

[1] Fordham University Press, New York, 1911.

[2] December, 1906, IV, No. 4.

At Pisa, Cesalpino taught and Galileo studied. At Salernum, whose school of medicine was cradled in the cloister of the monastery of Monte Cassino, and was fostered by the Normans during their rule over Southern Italy and Sicily, medical learning was developed to its highest degree, and achieved its greatest reputation during the time of the Crusades, when it healed the wounds and cured the diseases of cross-bearing knights and potentates.

Salernum preserved and taught the element of medicine, as transmitted through the Arabians, from the seventh to the fourteenth centuries, during which period it was the chief seat of medical learning in the civilized world.

The history remains as one of the most brilliant and interesting chapters of the dark ages.

When Salernum had already begun to decline, and Padua was in its infancy, the School of Bologna was at its apogee. Begun in the middle of the eleventh century with a school of sacred letters, and civil and canonical law, by the close of the thirteenth century, there had been added schools of medicine and philosophy; and to it had been attracted in a single year, not from Italy alone, but from every part of Europe as far north as the British Isles, ten thousand students. To Bologna was assigned the rare privilege of connecting the old learning and the new, and of occupying a place of equal prominence in each. Its medical school, however, belongs to the new, for it begins with the date 1260, when Taddeo di Alderotto came from Florence and began the teaching and practice of medicine in Bologna. . . Settled in Bologna he acquired, in a short time, extraordinary celebrity and immense riches. . .

To the spirit which from his professional chair he infused into the teaching and study of medicine, undoubtedly is due the high position which for many generations thereafter, the School of Bologna continued to maintain as a center of medical teaching. It needs no great stretch of the imagination to picture somewhat of the effect that contact with such a man might have in molding the character of his young neighbor and pupil, the chemist's son (Mondino) who, a few years later, by his devotion to the study of human anatomy, was to re-establish the practical pursuit of

study of the human cadaver as the common privilege of the skilled physician, and was to establish his own name ineffaceably on the records of medicine. . .

During the early years of the Renaissance, the glory of the University of Bologna was its school of medicine and the glory of the school of medicine was its teaching of anatomy. As the restorer of anatomy, Mondino has ever received universal acclaim. . .

He was born at a time when everywhere throughout Italy free thought was being awakened, curiosity and speculative audacity were being encouraged and the pursuit of learning new things had seized upon all classes. There is no figure in all history that represents this spirit more fully than Frederick II (1194–1250), King of Sicily and Emperor of the Holy Roman Empire, the indomitable, the learned, the law giver, patron of the arts and sciences, warrior and statesman. For nearly fifty years he was the dominant figure in the life of Italy.

The study of anatomy, before and after Mondino, was manifestly cultivated rather as an appendage of surgery than as a special branch of medicine, and was confined to men who left their names to some discovery, like Matteo da Grado, who first represented and described the ovaries in the proper, correct light; Alessandro Achillini of Bologna, who first described the two tympanal bones, termed malleus and incus, showed the tarsus consisting of seven bones; mentioned the orifices of the ducts and described the duodenum, the ileum and the colon; and later Berengario da Carpi, author of a compendium, several treatises and lectures in which he rectifies the mistakes of Mondino.

Da Carpi published an accurate anatomical work, in which he describes the several layers of tissues of which the stomach is made, and for the first time the vermiform appendix of the cecum, the communication of the duodenum with the gall-bladder, and the finding

of the opening of the biliary duct in that portion of the intestine.

For many centuries Italy had the distinction of being the country of the most eminent anatomists, who flourished during that period of the Renaissance, a period also glorious in art and literature.

Bartolomeo Eustachio who described the part of the ear which bears his name, left anatomical plates which illustrate almost every part of the body; Matteo Realdo Colombo completed the anatomy of the bones; while Gabriele Falloppio, although he described in a masterly way the internal anatomy of the ear, yet his name remains attached to the uteroperitoneal canal which he discovered.

The specialist remembers the description of the sphenoid and ethmoid bones of Giovanni Filippo Ingrassia, and the work of Giulio Cesare Aranzi on the inferior cornua of the ventricles of the cerebrum. But every student is familiar with the name of Costanzo Varolio, the great anatomist and lecturer of Bologna who gave his name to the organ which connects the cerebrum, cerebellum and medulla oblongata.

Costanzo Varolio was the greatest anatomist not only of Italy but of the whole world, and although he died young, he left works which place him among the greatest scholars and the greatest teachers of anatomy, in a particular epoch which had already seen the splendid plates of Leonardo da Vinci (*Le Tavole Anatomiche*), lately so carefully reproduced by the University of Christiania as one of the greatest masterpieces of art.

Hieronymus Fabricius ab Aquapendente, a pupil of Falloppio, followed Varolio's work, and to him goes the

merit of giving to anatomy the character of a useful as well as an accurate science. His association with his pupil, Giulio Casserio of Piacenza, famous for his physiological discoveries, connected the two studies of anatomy and physiology, in reference to the vital functions of the body, thus influencing further researches as to the function of the different organs, and leading to the discovery of the circulation of the blood described by William Harvey, one of his pupils at the University of Padua.

The history of anatomy is so closely connected with the various names of Italian anatomists that it is sufficient to mention only the principal scholars and teachers to find some sections of the human body bearing their names as discoverers or illustrators; for instance, Gasparo Aselli; Giovanni Domenico Santorini; Marcello Malpighi; Paolo Mascagni; Antonio Scarpa; Luigi Rolando; Filippo Pacini; Eustachio; Varolio; Falloppio; Mondino; Sarti; Lanfranchi; Bottallo; Carlo Giacomini and many others flourishing in the time of the Italian Renaissance and the years following up to the present generation of new Italy, when the revival of the anatomical studies seems to proceed with the same activity as those of surgery on a road of wonderful achievement.

There are at present seventeen universities in Italy, all under the control of the Government, with a complete course of medicine and surgery of six years' duration. Each is administered by the same standard and regulations, and provided with a staff of professors and instructors elected by a special board after public examinations, or by the exhibition of some scientific

studies or contributions which would entitle the candidate to the responsible position of teacher.

At the end of each year the pupil is submitted to an examination on every subject taught during the year so as to ascertain if he is fitted to continue the courses which follow.

After passing successfully the six yearly examinations, the candidate is admitted to a final public debate held before the faculty, which, after a favorable vote, confers upon him the degree of Doctor in Medicine, Surgery and Obstetrics, with a diploma called "Laurea," the final legal document of admission into the practice of the profession.

Since the unification of Italy under one Government in the last fifty years, the standard of surgical education has rapidly improved in every one of the universities, not only on account of the selected staff of teachers, but also through the emulation of the regional universities.

It is well to state here that the standard of medical education is the same all over the country, that no medical schools are recognized or even permitted in Italy except those approved by the Government which are under the control of the universities, and that nobody is allowed to practice medicine or surgery unless he has received the proper degree of "Laurea."

All the surgical schools of Italy had from the beginning of her unity, a vital impulse from the biological sciences, of which the leading spirit was the lamented Giulio Bizzozzero. Under his patient and able tuition, a great many distinguished teachers now holding the chairs of pathology in the various universities were

educated, filling both the scientific and the practical needs of the surgical schools, building laboratories, opening surgical clinics, and improving scientific knowledge by experimental work.

At present the surgical training at the Italian universities is imparted by two separate sections: The surgical section on pathology, which is essentially a theoretic school, combined with the examination of the patients; and the surgical clinic to which are attached the diagnostic and the operative departments.

A host of free docents and adjunct professors attend to the special tuition and training of the students in the laboratories, in the hospitals, and at the bedside, completing the theoretical and practical education with diagnostic demonstrations and laboratory researches drawn from the abundant clinical cases selected for that purpose.

The actual number of universities in Italy far exceeds the needs of the country. Before the unification of Italy, when the country was divided still into small kingdoms and principalities, the existence of a university for each state was justified, especially for political reasons. At present, political and social reasons have disappeared in the face of national unity, and modern facilities of communications have eliminated the necessity for local universities. The Nationalist, besides, finds that the mixing of the various elements of the population improves the national unity of the country.

The concentration of these scientific centers would no doubt strengthen the economic force in the universities retained; it would give a chance to establish large clinics, to furnish perfectly equipped laboratories,

to promote more uniformity of work, and to provide facilities for the exchange of knowledge, thus fostering progress in science. It would eventually attract more attention from the outer world, and place these great centers of study in contact with the scientific students of foreign countries to the benefit and advancement of intellectual and practical human welfare.

Chapter XI

THE UNIVERSITY OF ROME

ROME, since September 20, 1870, has been the capital of the Kingdom of Italy. On that day, Rome ceased to represent only the two great historical epochs of the past, and became the head of a new nation, the capital of United Italy.

It is not the place here to review the historical events of the last century, when the dream of Dante and the aspirations of so many worthy patriots materialized under the persistent intellectual work, the courageous undertaking, and the sublime sacrifice of lives which accompanied the long struggle for the liberation of Italy from foreign bondage and slavery.

Suffice it to say that Rome and the Romans took a noble part in the struggle, writing in the history of the Italian Revolution one of the most glorious pages, when, in 1849, they strenuously defended the Roman Republic against the three armies of the Bourbons, of Austria, and of France, succumbing only to the preponderance of the enemy's forces. All Italy's thoughts turned toward the new capital, which represented the final achievement of her long-sought independence and her cherished unification under one flag.

One of the most important tasks of the new Government was the reorganization of the universities under one standard, abolishing with difficulty many old traditions and prejudices. Some of the most prominent

and noted scientists of Italy were called to Rome to work together for the purpose of making the capital a center of national education, of making Rome worthy of her ancient reputation and great name.

Large appropriations were at once voted by Parliament for the most urgent needs of the city's sanitation—the diking of the Tiber with colossal walls to prevent the annual floods, and the cleaning of ancient quarters, turning them into new and modern buildings. Soon the city, which had been for centuries the shop of antiques and curios and the museum of decaying monuments, developed into a beautiful modern city. Two of the most prominent citizens of Rome, scientists of great reputation, Rodolfo Lanciani and Giacomo Boni, took charge of the delicate task of preserving the historical monuments, attending with great care and intelligence to the new excavations and discoveries for the benefit of students and the advancement of historical knowledge and progress.

Scientific laboratories for the study of malaria and other diseases affecting the Roman Campagna were founded by the Government with the aid of private citizens, and several special commissions were organized for the study of sanitary and other improvements of the great city.

An active crusade against illiteracy, superstition and ignorance made the surroundings of Rome, once unsafe, unhealthy and deserted, the happy resort of tourists and travelers. As a result, more than twenty years ago, the American Consul in Rome, Mr. De Castro, sent a consular report to Washington, published in the newspapers of that time, which read:

To my previous reports I will add that Rome is now well paved and well cleaned. Its system of drainage has been perfected at enormous cost, and there has been sent rushing through its pipes one of the most remarkable water supplies ever known. From one source alone the city derives millions of gallons daily.

The Aqua Marcia, that leads all the way from the Sabine Mountains and dates from 146 B.C., was restored in 1869, and now brings a distance of nearly sixty miles such a flood as to contribute with the other Roman aqueducts to keep the city in one endless and royal splash.

The numerous colossal fountains of Rome know no pause, all day long they continue their spouting, making a display, beside which the fountains of Paris, great as they are, are downright niggardly.

And now, as to the actual effect of the sun in Rome. Yesterday, which was one of the hottest days of the month, the thermometer registered 92 degrees. This in New York, with the humidity which so often prevails there, means a most debilitating state of atmosphere. Here, incredible as it may seem, it does not produce unbearable discomfort. It is hot, of course, but the air is light and dry; there is always a breeze moving and, comparing the two cities most carefully, I should not hesitate to say that Rome, on a day like yesterday, is as much the superior of New York, in respect to comfort, as is many an American town among the mountains or on the coast that is patronized as a summer resort.

The nights are always delightfully cool, and there is no difficulty in obtaining a long and refreshing sleep.

Notwithstanding the frequent protests of some fanatic lovers of antiquities against the so-called demolition of ancient Rome (which protests were once wittily answered by an energetic mayor of the city), the improvements progressed rapidly, without interfering with the work of excavation, intelligently directed by Professor Boni and so profusely illustrated by Professor Lanciani above mentioned.

In a highly interesting letter, dated May, 1916,

Prince Colonna, then Mayor of Rome, discusses the industrial future of the city, and foresees great advantages from the utilization of her many agricultural resources, buried in the "Agro Romano," the immense stretch around Rome. He claims in his letter that many institutions of industrial and scientific learning could be established there, making it a center of economic and commercial advancement. His letter was an answer to another prominent Roman patrician who, instead, wanted to make of Rome an aristocratic center of sport and luxury so as to attract wealthy foreigners.

The unexpected and fortunate end of the war, which gave to Italy such a different standing among the great nations of the world, placed her capital in a much higher social position, as the head of a completely united nation of more than 40,000,000 people.

Since 1870 the population of Rome has been growing at the rate of 20,000 a year, and has now a large area built with modern houses, villas and apartments to rival any of the most modern cities of the world. The reason for such a rapid increase of population can be ascribed to her healthful and salubrious location, to her climate, to the splendid organization of her public services, to the exceptional abundance of water considered as pure as if filtered, to the perfect system of drainage, to the absence of manufacturing centers and the scarcity of a working population, facts which make contagious diseases less frequent and residence there preferable to any other big city in Europe.

Rome's water supply is a marvel. The four main aqueducts—the Marcia, the Felice, the Paola and the Vergine—come to the city from a long distance, giving

Rome 1,028,243 cubic feet of water per day at a rate of 400 gallons per head while London has 30 and Paris 40 gallons only per capita.

The days of bad sanitation and bad administration are past, for, although the Roman municipal authorities are not perfect, a very efficient control is maintained over the city, and the management of its affairs improves year by year. When one comes to consider the physical well-being of the Roman population, one sees that any statement against the healthfulness of the city is not in accordance with facts, for a healthy population cannot exist in an unhealthy city. The people of Rome are, on the whole, remarkably healthy. Even the poorer classes who live in rather crowded, not always hygienically kept quarters, enjoy comparative immunity from sickness, which can only be explained by the purity and salubrity of the air and atmosphere of the city and its surroundings.

The climate of Rome is pleasant and mild during the winter, which is short, lasting only from December to February, when spring may be said to begin. Only one month of summer is unpleasantly hot and even in August the nights are cool.

The excellent guide to the province of Rome by E. Abbate, mentions several health resorts around the city, famous during many centuries for their curative qualities in various diseases. Very popular is the "Acqua Cetosa," just outside the Porta del Popolo, close to the bend of the Tiber, and the "Acqua Santa" near the so-called "Grotto of the Nymph Egeria" outside Porta San Giovanni, along the Via Appia Nuova. Both waters are sold everywhere for drinking purposes,

and are considered beneficial in nervous troubles due to stomach and kidney impairments.

Famous also is the "Acque Albule," so called from their milky color. This spring gives 60,000,000 of gallons of water per day, providing a complete modern bathing establishment, situated in picturesque grounds, with every convenience for treating, under medical direction, diseases of the kidney, bladder, gout and rheumatic affections. Annexed to the establishment are several open-air swimming pools which are well patronized during the summer by excursionists from the city, the distance being only one hour by car.

Another sulphurated hydrogen water, similar to the "Albule," is that of "Stigliano," near Civitavecchia. One of the springs there has a temperature of 133 degrees and is wonderfully beneficial in chronic rheumatism and rebellious skin diseases. Some other mineral springs: Sferracavallo, Ficoncella, and Palazzi, also near Civitavecchia, are popular in similar diseases.

A very popular drinking water, like the White Rock of America, comes from Fiuggi (near the picturesque village of Anticoli di Campagna, a short distance from the city of Prosinone), where a very enterprising company has built hotels and establishments well patronized by the social world of the capital.

The University of Rome like many of the Italian universities had its origin toward the end of the thirteenth and the beginning of the fourteenth centuries. It was founded by Pope Boniface VIII for the benefit of impecunious students who came to Rome from other parts of Italy or from foreign countries.

The university went through the many vicissitudes of war, pestilence and invasions, which reduced the number of students, sometimes the number included only the teachers. Besides, the restrictions upon the teaching of liberal ideas greatly hampered the progress of study.

After 1870, the surgical clinic was temporarily placed at the San Giacomo Hospital, under the direction of Professor Corradi, who was called from Florence.

Later, Costanzo Mazzoni succeeded Corradi, notably enlarging the clinic and introducing the Lister antiseptic method. A man highly educated, well posted upon the progress of surgery abroad, where he had spent some time visiting French, English and German clinics, Mazzoni selected some of the best men as assistants, among them his nephew Gaetano Mazzoni, Paolo Postempski and Francesco Durante, who afterward became the leaders of the surgical school at Rome. A skillful operator and learned lecturer, Costanzo Mazzoni left many valuable works and a great many pupils who honor his name.

At his death in 1885, Francesco Durante, who was his first assistant and professor of surgical pathology, succeeded him in the chair of clinical surgery, which he moved to the new Polyclinic Hospital, promoted and brought to completion by the genius of Guido Baccelli, the eminent professor of clinical medicine at the University of Rome. Francesco Durante held the chair of clinical surgery from 1885 to 1919, when, by reason of the age limit, he was regretfully retired. The work of Durante as a teacher, as a scientist and as a surgeon, has been marvellous, and of him it can be said that he

Dr. Guido Baccelli, Rome.

succeeded to perfection in coupling science with art in surgery. Before he assumed the chair of clinical surgery he had been professor of embryology and histopathology and brought to the operating room full knowledge of those two important parts of modern surgical practice.

Long before Cohnheim, Durante published a histologic study of maternal moles, in which he proved that tumors can derive from cellular elements keeping the embryonal character.[1] In a very important volume published in 1876, "Surgical Diagnosis of Tumors," he presents his theory in such a clear way that his book can be used as a text for the student. Another of his books, "Surgical Pathology and Therapy," used also as a text by the students, is a complete treatise on the subject. It would take too long to enumerate here his works on surgery of the brain, on resection of the cecum for tuberculosis, and on resection of the larynx by anterior flap of the neck, with immediate suture of the pharyngeal opening with "prima intentio" healing. The injection of iodides in surgical tuberculosis, which is still used successfully in his clinic and in most of the clinics throughout Italy, is one of his original findings.

His successor, Roberto Alessandri, his assistant for many years in the chair of surgical pathology, is, with the other assistants, contributing to the compilation of the last work of Professor Durante—"The Treatise on Operative Medicine," which will be a voluminous and complete work of practical surgery.

Of Professor Alessandri's numerous publications,

[1] *Palasciano Arch.*, ii.

those worthy of mention are—"The Experimental Study on Surgery of the Kidney," "Surgery of the Gall-Bladder and Adnexa," "Hernia of the Bladder and its Pathogenesis," "Diagnosis and Treatment of Tumors of the Bladder," "Pseudotuberculosis of the Peritoneum from Vegetable Residue," and "Importance and Limits to the Bloodless Treatment of Surgical Tuberculosis."

Professor Alessandri's address is rigorously scientific and his teaching shows a wonderful modern activity which has inspired some of his pupils to follow his example in original researches and publications. As colonel in the reserve, he was at the front and gained the silver medal for valor. He has published some valuable pamphlets on war surgery.

The Surgical Clinic is connected with the Ministry of Public Education. It disposes of 80 beds, with the privilege of selecting material from every hospital in Rome. The Clinic, besides, has very large commodious rooms for attendance and service in that beautiful and great Polyclinic, at the entrance of which stands a large marble bust representing "Lord Lister," in honor of his great work on antisepsis. This fact ought to persuade Sir Rickman Godlee of the great mistake made in his book on "Lord Lister" in which he treats Italy almost as a savage country.

Besides the numerous laboratories, and a large stable for the care of the animals intended for experimental work, there are a pathological museum, a library and a big lecture hall with an amphitheatre for operations. Annexed to the Surgical Clinic, is the institute for the treatment of diseases of the eyes under the direction of

Bird's-eye View of the Polyclinic Institute, Rome.

an able specialist, Prof. Giuseppe Cirincione; a department for eyes, nose, and throat under Professor Ferreri; one for gynecology under Professor Pestalozza; and one for orthopedics and traumatology under Prof. Della-Vedova.

There are at the Polyclinic three separate surgical sections of 76 beds each, under the direction of Prof. Raffaele Bastianelli, Roberto Alessandri and Oreste Margarucci. Each one is amply furnished with its own laboratories, operating rooms, equipments and several assistants for the instruction of the students and physicians in need of a post-graduate course. In each one of these sections the number of operations averages between 800 and 1,000 a year.

Prof. Raffaele Bastianelli, well known to American surgeons through his frequent participation in the Surgical Congress in the United States, was also in the Reserve Corps during the war, directing one of the movable hospitals at the immediate front, where he had the opportunity of performing a great many operations in thoracic and abdominal surgery when immediate intervention was necessary.

In 1918, at the Surgical Congress held in the United States just before the end of the war, he delivered several lectures on thoracic surgery, and on the results of his experience at the front, including most valuable statistics of numerous cases, in which Morelli's method was successfully used to stay hemorrhage in the lungs.

Bastianelli's extensive contribution to scientific surgery is familiar to most of the leading surgeons of America. Well known are his contributions relating to tumors of the mouth and tongue, general abdominal

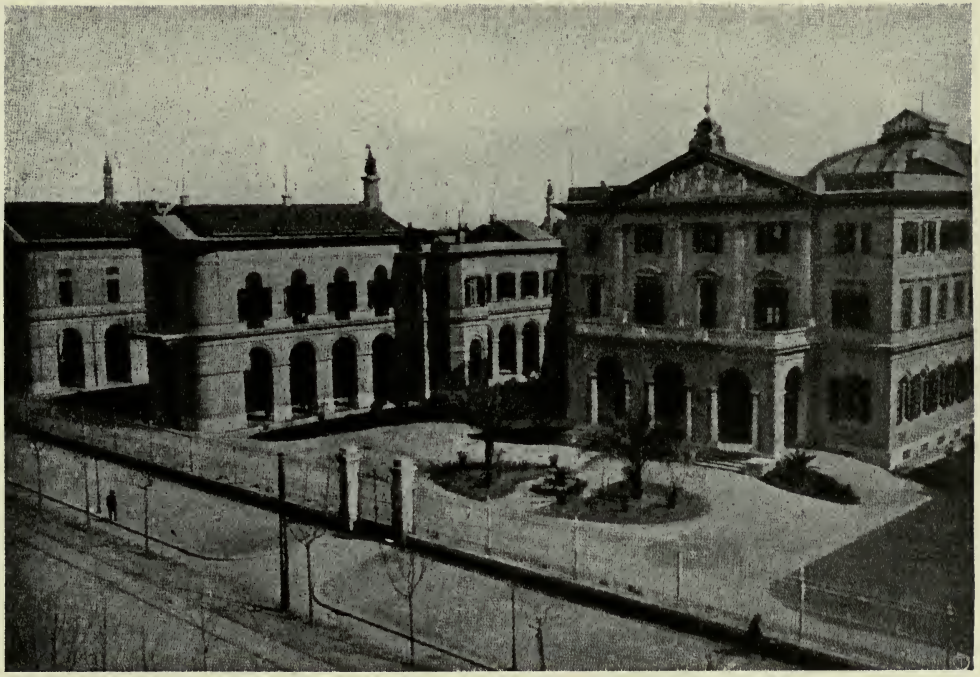
surgery, surgery of the stomach, liver and biliary appendage; and to the study of degeneration of parenchymatous organs through poisoning by chloroform.

He also demonstrated the practical use of Vanghetti's method in cinematic surgery for the utilization of muscular loops in amputations, including the advantages that it can give to the action of artificial limbs after war injuries.

Besides lecturing at the Polyclinic, always to a large audience of students and professional men eager to learn from his skillful operations, Bastianelli has a private hospital (Viale della Regina, 203) where he performs a great many operations, especially assisted by Dr. Vittorio Puccinelli, who is one of the promising young practitioners of Rome with many valuable publications to his credit.

The third director of a surgical section at the Polyclinic is Prof. Oreste Margarucci, a very distinguished surgeon and author of several very important publications: "On Peritoneal Tuberculosis," " Arterial and Venous Circulation of the Ureters," "Bony Regeneration," and "Surgery of the Biliary Organs."

Besides the Polyclinic, Rome has a number of conspicuous hospitals, some quite old like the Santo Spirito, San Giovanni and San Giacomo, which have been recently improved with all the modern appliances and advantages, and some perfectly new—furnished throughout with the latest scientific and practical needs of the present time, of which the military hospital is a model. The head surgeon of the San Giovanni is Prof. Gaetano Mazzoni, one of the most brilliant operators, who has contributed to the surgical literature



Main Entrance of the Polyclinic Institute at Rome.

some very valuable works on abdominal, thoracic and bone surgery.

Prof. Paolo Postempski has been identified for a great many years with the San Giacomo Hospital, which he has modernized, building and equipping the operating rooms and laboratories according to the latest scientific requirements.

The popular publications of Professor Postempski include articles on surgery of the articulations, and thoracic and abdominal surgery, and it is worthy of mention that he made the original diaphragmatic laparotomy and published an article on it in the *Riforma Medica.*

At the San Antonio Hospital, Prof. Vincenzo Montenovesi did some remarkable original work in brain surgery in which he is considered an authority.

Mention must be made here of the principal teachers of general and special clinical pathology who have disdistinguished themselves because of their valuable work—like Profs. Amico Bignami, Eugenio Rossoni and Achille Boari in surgical anatomy, who, with Umberto Arcangeli, Oreste Ferraresi and Alessio Nazari, lecture on pathology, anatomy and histology. Eugenio Cassini occupies himself at the general surgical clinic, and Giovanni Impallomeni devotes himself to instruction in orthopedics.

The large staff of adjunct professors of surgery is necessary for the needs of the many ambulatories established in the different sections of the city and for the inspections outside the city, thus giving to Rome one of the most perfect systems of medical attendance a modern city can desire.

[1] 1890, i, 647.

Chapter XII

THE UNIVERSITY OF BOLOGNA

THE University of Bologna should be the first to be mentioned in this book because of its ancient origin and its scientific and historical importance, while Rome takes precedence only for political and national reasons.

Tradition ascribes its foundation to Theodosius II (Roman Emperor of the East from 408 to 450) in the fifth century, but the historical date of the university's foundation has now been fixed as 1088, since it was at about that period that the famous Irnerius began to teach Roman law, philosophy and letters, lectures which attracted multitudes of students from all over the world. For that reason, in the summer of 1888, Bologna celebrated its octocentenary festival with great pomp. All the Governments of foreign nations were represented—America, by Prof. W. Story of the National Academy of Sciences, Washington, D. C., who delivered his speech on behalf of the United States.

Originally the ancient Etruscan Felsina was colonized by the Romans in 190 B.C.; afterward it was made a free city by Charlemagne. Ancient coins bear the legend "Bononia Docet," from its fame as a seat of learning.

Bologna is interesting for its monuments, its famous towers, the picturesque buildings with arcades, the palaces, the churches, and for a population noted for its traditional good looks and robust appearance. It

Prof. Raffaele Bastianelli, Rome.

owes its popularity to its wealth and prosperity as the center of one of the richest provinces of Italy.

The city is famous, not only for its ancient origin, its wealth and interesting monuments, but also because its inhabitants have always been, and especially during the last century, among the foremost champions of the independence of Italy. In the year 1848 the population of Bologna vigorously repulsed a superior force of Austrians and in 1849 a patriotic priest, Ugo Bassi, was executed for his devotion to the cause of Italian liberty. Later, Count Aurelio Saffi was, with Mazzini and Garibaldi, a defender of the Roman republic.

It was at the University of Bologna that lectures were delivered by Malpighi, Valsalva, Morgagni, Galvani, Aldrovandi, Marsigli, Zambeccari, and many others famous throughout the world. The present school of surgery of Bologna is one of the best, not only in Italy but also in Europe. It is that admirable school which has been supplying for a great many years past so many distinguished surgeons to the numerous hospitals of the large and small cities of the compartimentos of Emilia and Romagna, the two most prosperous provinces of northern Italy.

The old glorious traditions have not been lost, for, after the death of the famous Dr. Francesco Rizzoli, toward the middle of last century, his successor, Prof. P. Landi, left important contributions to literature on almost every surgical case which he had treated with singular skill and success. And so did another famous surgeon, Prof. P. Loreta, well known throughout the surgical world for his treatment of pyloric and cardiac strictures by digital divulsion, and for his many

original publications on the surgery of the liver and intestines.

The chair of surgery, held by Prof. A. Poggi, was later occupied for several years by Prof. G. F. Novaro, and, finally, until last year, by Prof. G. Ruggi who retired because of the age limit, to the great regret of his colleagues and students.

Prof. G. Ruggi has been one of the most original and successful teachers of modern surgery. In surgical literature his method of radical cure for crural hernia by the inguinal process, his special method of vaginal hysterectomy and abdominal sympathectomy in cases of obstinate utero-ovarian neuralgia, also his original technique for the resection of the knee and for abdominal operation in large cystomata of the uterus, are well known in surgical literature, and are practiced. But to Professor Ruggi is due the credit for having popularized the method of the antisepsis of Lister in Italy by means of two well-known publications (1878–1879), the value of which is enhanced by ample statistics, which clearly contradict the gratuitous assertion of Sir Rickman Godlee, in his volume on Lord Lister (London, 1917).

In 1888 Professor Ruggi published statistics of 100 cases of laparotomy which he had performed with 16 per cent mortality, and ten years later, statistics of 1,000 cases of laparotomy with only 2 per cent mortality. Proud of the Italian school of surgery in which he has been such a worthy champion all his life long, in his inaugural speech at the opening of the annual course of lectures, he said: "We in Italy have been too prone to admire foreign work, neglecting often what we have done at home, which we only know from foreign

publications. It is now time that such servitude, which is looked upon with contempt by foreigners, should cease, by starting a just appreciation of our own great work, of what we really can do at home, and of which we can and we must be proud."

The special chair of surgical pathology has been held by Prof. Alfonso Poggi, a pupil of Prof. Guido Tizzoni (of tetanus fame) and of Professor Loreta. Professor Poggi has to his credit some very interesting work on osteoarticular surgery and an original publication on rare echinococcus of the retrovaginal septum. Original are also his publications on primary healing of wounds dressed with carbolic acid solutions, including deep burns and large contusions. His abundant literature deals also with classical works on the gall-bladder and the technique of its reconstruction, with primary healing of wounds of the stomach, and reconstruction of the mucous intestinal layer of the jejunum.

Interesting also are Poggi's experiments on the reproduction of the pocket of the gall-bladder after cholecystectomy, demonstrating the necessity of resecting the gall-bladder as near as possible to the choledochus to avoid the return of calculi.

Ruggi, after his retirement as professor on account the age limit, was succeeded by Prof. Bartolo Nigrisoli as lecturer, on account of a long and extensive experience, especially in abdominal surgery of the liver and spleen.

The surgical faculty of Bologna has other distinguished teachers who, in the various clinics of the Ospedale Maggiore or Ospedale di St. Orsola, lecture to the students and young doctors. Among the best

known for their technique is Prof. Umberto Monari, who has contributed largely to the surgical literature of the intestines, of the uterus, and of the ureters. He has reported a case of Gasserian ganglion operation.[1] Prof. Benedetto Schiassi, another famous surgeon, published very interesting studies on the treatment of the ascitic abdomen in cirrhosis of the liver, with the surgical deviation of the blood to the portal vein; on the movable kidney; besides several other cases of high abdominal surgery. Profs. Egisto Magni and Ulisse Gardini have also furnished important contributions, the former on transfusion, the latter on prostatectomy, which have received considerable attention from professional men.

Radioscopy is so closely connected with surgery that it is worth while mentioning here the importance that this special branch of study has in the University of Bologna. Lately, on the initiative of Prof. Aristide Busi, director of the department of radioscopy, the radiologists of the province of Emilia decided to hold periodical reunions for the purpose of discussing the progress of radiotherapy. The first of these reunions took place at Villa Verde, in the Institute of Radiology of Professor Busi. There were present, besides Professors. Busi, Biffi and Balli, Drs. Rossi, Sighinolfi, Palmieri, Maffeo, Tarugi, Fiorini, Magni, Ramusani, Tapparelli, Pini, and Montanari. After an exhibition of the various departments of the institute by Professor Busi, who showed the numerous and perfect instruments made at the well-known factory of Balzarini & Gorla in Milan, and gave a demonstration of the different appli-

[1] *Beitr. z. klin. Chir.*, Tübing 1896, XVII. Ein Fall von Resection des Gasser'schen Ganglion.

cations of the apparatus in medicine and surgery, some plates yielded the opportunity for a scientific discussion on differential diagnosis, and also the application of new methods in the treatment of infantile coxitis by *x*-rays as advanced by Tarugi. Of such reunions, which promise to be frequent, a report will be given to the public in a special review.

Bologna is a city of learning, a center of modern progressive education which earnestly follows the traditions of its glorious past. Besides treasures of old monuments, interesting palaces, artistic churches, odd and curious arcades, filled with precious collections of paintings and sculptures of historical import, which make Bologna an attractive place to visit, there is a modern part of the city covered by imposing and elaborate buildings devoted to scientific study and research. Each building is an institute of scientific learning, of architectural elegance, surrounded by attractive gardens, and furnished with all the scientific modern equipment necessary for teaching and demonstration to students.

In the medical department is the remarkable Institute of Normal Human Anatomy, worthy of the tradition of the famous school of anatomy of Bologna which for seven centuries held the primateship in the world because of Mondino de'Liuzzi (*d.* 1326) Berengario da Carpi (*d.* 1536), Andreas Vesalius (*d.* 1564), Giulio Cesare Aranzi (*d.* 1589); Costanzo Varolio (*d.* 1575), Marcello Malpighi (*d.* 1694), Antonio Valsalva (*d.* 1723), Leopoldo Caldani (*d.* 1760)—names familiar to every student of anatomy.

This building has two large halls, one in the form of

an amphitheater with a seating capacity of three hundred, with an annex for dissecting purposes seating over a hundred students at one time. There is also a small amphitheater for annual lectures with a hall annexed for dissections needed for the lectures, a special laboratory for assistants, and rooms for photography, for the storage of cadavers and preparations, the underground deposit; the upper floor for the collections, the library and directors' offices.

The annexed museum contains two thousand specimens, some from the time of Valsalva, and two thousand craniums catalogued by Luigi Calori. The institute is well provided with all the most modern means for demonstrations: a large epidiascope, apparatus for morphological and histological projections, microscopes, binoculars, stereoscopes, ultramicroscopes, a special apparatus for wax reproductions of embryos; in fact, everything that modern science requires for that branch of study.

Adjacent to the Institute of Normal Human Anatomy is the Institute of Pathological Anatomy, provided with a large amphitheater, and a large laboratory for histological, bacteriological and chemicopathological experiments, beside sample rooms for vivisections, a museum, library, rooms for private experiments and for the directors. It is also furnished with a large apparatus for projections, a frigorific room for cadavers and a crematory for animals. The museum has a rich collection of more than 2,000 specimens, some very original and rare, collected by the late Prof. Cesare Taruffi.

Mention must be made here of the new Institute of Anthropology, established especially for the large collec-

Bologna, from the Rizzoli Orthopedic Institute.

tion and of biologic and anthropometric instruments with which it is provided for use in connection with criminal anthropology.

The most important institutes are those of experimental physics, of experimental physiology, and of histology and general physiology: the last one, interrupted by the Great War, is now nearing completion. All three institutes are well provided with instruments, apparatus and materials for demonstrations, as well as museums and libraries for the convenience of students and frequenters of the schools.

The medical and surgical clinics and the various special clinics are all annexed to the St. Orsola Hospital and the other numerous hospitals of Bologna. Of the Rizzoli Orthopedic Institute, a full description has already been given in a separate chapter, in which the orthopedic schools of Italy receive the attention they deserve.

Before closing this chapter reference should be made to the opinion which is popular among the intellectual classes of Italy, that Bologna will be the center of future university activities in Italy, a sort of post-graduate study and education for the world. It is certainly difficult to predict what will be the intellectural future of Italy in Europe, but with the favorable location of Bologna only a few hours by rail from Florence, Venice, Padua and Milan, at the head of the most fertile region of Italy, thickly populated by a prosperous industrial race ambitious of renewing a glorious past, the prospects are favorable as regards this prediction.

When a city so highly appreciates the noble mission of education, it is natural that the teaching staff should

include the greatest representatives of every branch of study. From the twelfth century on, beside the leading study of law, there also continued to flourish at Bologna those studies which our ancestors fitly called liberal arts and humane letters; and the fame of the university also attracted both teachers and students of various minor branches of knowledge which contribute to enrich and ennoble human life. And thus was our modern idea of a university developed and defined at Bologna during the thirteenth century.

With historic repetition, in a new age of marvellous development built upon almost irreparable ruin, the University of Bologna, because of the virility of her ancient memories, may some day resume the civil jurisdiction which she once exercised. If so, she will resume it in a higher, nobler, and purer sense, by developing for the benefit of every nation another portion of the inheritance of ancient Rome.

Italy, with the brains of her beheaded martyrs, with the books of her philosophers and the songs of her poets, with her clever diplomacy, with the sword of revolution, and with the artillery of her army, knocked persistently at the gates of Rome until she was enthroned upon the Quirinal and the Capitol.

And this sacredness of daring and devotion, unheard of in any other history, has rendered her worthy of this—a monarchical republic, with monuments of gratitude to Mazzini, to Cavour, to Victor Emanuel, II and to Garibaldi, all conspiring with a common object in view—the great Italy of today.

Hence it is that Bologna, the first university town in the world, the first center of learning, the proud jailer of

King Enzo (a German emperor), the possessor of the venerable temple of San Petronio, which was reared in memory of the overthrow of the domestic tyranny of the Visconti, the cradle of so many patriots and martyrs of the Independence of Italy, has placed herself courageously and energetically at the head of a great educational movement which will rival her glorious past.

Chapter XIII

UNIVERSITIES OF MODENA AND PARMA

LOOKING over the map of the Emilian region, one wonders why, at such a short distance from Bologna, there should be two other universities like Modena and Parma, both of which hold an important place among the universities of Italy.

The reason is obvious. When the little principality of Parma and Piacenza, and the little duchy of Modena, after the war of 1859 between Italy and Austria-Hungary (which gave the former the new kingdom of Lombardy), decided, by popular plebiscite, to be annexed to Italy, the new government inherited the old institutions which were for centuries the pride of those small states.

The real restoration of the old University of Modena to a progressive institution was due to Duke Francis II, in the year 1678; afterwards, its greatest reputation was achieved with the famous constitution of Francis III in the year 1772. A period of decadence followed until 1887, when new life was put into the institution, placing it under the same rules and regulations as the other state universities.

At present a very distinguished pathologist and clinician, Prof. Mario Donati (pupil of Prof. Antonio Carle of Turin) is the director of the surgical clinic of the university. A very active and prolific scientist, he has produced some original works on the pathogenesis of gastric ulcer, on the surgery of the stomach, and especially on ulcer of the stomach, the last receiving the

Zanetti prize at Florence. A complete study which he made in 1901 on the blood of cancerous people was considered one of the best monographs of the time. His contributions to the surgery of the kidney and esophagus, adding some valuable modifications to endothoracic surgery, and on the intratracheal technique of Meltzer and Auer, are also considered very important. He published some experimental studies on cystitis from staphylococcus and renal infection (1907). Original are his anatomic studies on the inguinal canal of women in relation to direct inguinal hernia, as are those on tumors of the biliary canal, on hypernephroma, muscular angioma, acute vertebral osteomyelitis, malignant tumor of the thyroid, osteosarcoma of the ovaries, coxa vara following the fracture of the neck of the femur, and a complete study of the thoracic duct from a case, throwing light on the surgery of that organ (1914), etc. He is completing at present a treatise on the surgery of the abdomen, partly published by the Typographic Union of Turin.

Professor Donati took a very active part during the war, being a strong partisan of immediate intervention in the treatment of wounds, with instant suture. He obtained splendid results in his cases, especially in cranioencephalic and articular surgery. Although very young, he is one of the greatest surgeons of Italy and is destined to a splendid career. His modern spirit and activity are wonderful. He is planning the foundation of *The Archives of Surgery*, which no doubt will compete with any foreign publication of its kind.

The institute of surgical pathology is at present directed by Prof. Paolo Fiori who has already published

some very interesting articles on the pathology of the kidney.

Modena, the ancient "Mutina," is a quaint little city of about 25,000 inhabitants, very prosperous, industrious and wealthy. The city has an historical importance which is attested by the beautiful Cathedral begun under the domination of Countess Matilda of Tuscany (1099), the ducal palace of the time of the domination of the Estenses family, the remnants of the French invasion, and the many attractive buildings of modern Italy.

PARMA

More important than Modena is the city of Parma, one of the finest cities of northern Italy, with a population of about 50,000, industrious and wealthy. In the center of the city the Via Aemilia widens out into the Piazza Garibaldi, adorned by the Palazzo del Governo and the Palazzo Municipale, both magnificent structures dating from 1627. Here the Cathedral of the Assumption, consecrated in 1106, is also an imposing monument, full of artistic and precious ornaments, rare paintings and sculptures of the Renaissance period.

Everywhere the domination of the Farnese family is recalled by fine palaces, a large monumental theater, an academy of fine arts containing some precious frescoes, the famous "Madonna of San Gerolamo" and "Madonna Della Scodella" of Correggio. Ranuccio 1, of the Farnese family, founded the university in 1601 with the faculties of law, medicine and natural sciences, an observatory and a very interesting and rich collection.

In 1860, Parma, similar to Modena, by popular plebis-

cite was annexed to the kingdom of Italy, and its institutions became wards of the government of new Italy.

The University of Parma, although flourishing in the twelfth and thirteenth centuries, reached the height of its reputation under the Farnese family (1545) especially when Ranuccio I annexed the College of Nobles, a shelter for 300 scions of the noblest families of Europe. The university revived under Ferdinand I, the Bourbon, and again in the Napoleonic period, but declined at the beginning of the last century until its final annexation to the new kingdom of Italy, when it began to flourish again. At present it is very active.

The surgical clinic of the University of Parma was under the direction of Prof. Andrea Ceccherelli from 1882 to 1913, when this highly esteemed and able scientist died, leaving a large contribution to surgical literature. Editor of *The Surgical Clinic*, one of the most conspicuous scientific reviews of surgery in Italy, he handled every subject in the surgical field with scientific skill and knowledge. Well known is his special method of nephropexy with a special stitch over the last rib, and his own method of hemostasis of the liver.

Ceccherelli started a treatise on Italian surgery, with the purpose of compiling a real surgical encyclopedia with monographs from different Italian authors on original work. This treatise was interrupted by his death, and is now being continued by his successors. At present the surgical clinic is directed by Prof. Giuseppe Tusini, the originator and director of the Castrense University of San Giorgio di Nogaro, which was organized near the battle lines, for the instruction of the enlisted medical students during the war.

A pupil of the famous Prof. Antonio Ceci of the University of Pisa, Professor Tusini has already made a name for himself by his splendid publications on various surgical questions—"Varieties of Endotheliomata" (1898); "Actinomycosis of the Foot" (1900); "Tuberculosis of Certain Ovarian Tumors" (1904); "Contribution to the Study of Epithelial Etherotopy," "Primitive Alteration of the Epithelium," and "Carcinoma of the Intestine" (1908). He has several articles on "Visceral Echinococcus," and a very important work on "Polioadenopathy, Morbid and Chronic, in Hodgkin's Disease" (1900). During the period between 1903 and 1905, he published a study on "Solid Tumors from Embryonal Inclusions of the Large Ligament," and a study on "Infecting Papilloma of the Ovaries." Several contributions to the surgery of the stomach and the brain have placed Professor Tusini among the principal teachers of modern surgery in Italy.

Not far from Parma (about thirty miles), situated among the foothills of the Apennines, is Salsomaggiore, the new health resort, a charming little town of 1,200 inhabitants. The waters of Salsomaggiore are the richest in the world in iodine, bromine, strontium, lithium and sea salt. They are pumped up by artesian wells (from a depth ranging from 400 to 700 meters) which supply the three *Stabilimenti* in the town and also the Grand Hotel des Thermes, which enjoys the unique attraction of enabling its visitors to take their baths in the hotel itself, each floor being provided with special bathrooms for that purpose, in addition to the ordinary ones.

Beneficial results are felt at once in all cases of rheumatism and gout, rheumatoid arthritis, diseases of

women, anemia, convalescence after long illnesses, infantile rachitis, affections of the nervous system, neurasthenia (by bath cure), and diseases of the respiratory tract (by inhalation). These may fairly be termed marvellous.

The resort is run by a company which is interested in several big hotels well provided with all the comforts required for the treatment and accomodation of the numerous patients who patronize the famous place. Medical attendance of expert physicians, able nurses and fully equipped massage and electrical devices can be obtained in the place during the season, which extends from early spring to late in the fall. Salsomaggiore has a well-deserved world-wide reputation.

Chapter XIV

THE UNIVERSITY OF PADUA

IN the coming year, 1922, Padua will celebrate the seven hundredth anniversary of its university, the foundation of which was said to be a sign of rebellion against the tyranny of Bologna, which had forbidden its teachers to lecture outside the university.

Padua (Ital., *Padova*) is an ancient city in the northeast of Italy with about 80,000 inhabitants, lying in the center of a thickly populated district, rich in fertile land. Its origin dates from the Trojan Antenor and the inhabitants are descendants of the earliest settlers of the Venetian plains. Abano, only ten miles distant, was the birth place of Livy, and Padua, that of many illustrious Romans.

The city is crossed by the Bacchiglione River, spanned by many monumental bridges. The picturesque streets are lined by sumptuous palaces with elegant arcades, some of the palaces dating from the year 1172. The Palazzo della Ragione is famous for an immense hall 267 feet long by 89 broad and 78 high, standing upon arches; its walls are covered with symbolical paintings in fresco. This unique building is celebrated throughout the world for its enormous roof, considered an architectural wonder.

The history of Padua is very interesting because of the many vicissitudes it experienced from the time when it was a prosperous Roman city, until its ruin brought by the Huns under Attila (452), and by the

Goths under Totila. Following the course of many other cities of northern Italy, the city fell under the domination of the Lombards, the Franks, the Bishops, the Communes, the Despots, the Venetians, and, after a long period of Austrian supremacy, was finally united to the new kingdom of Italy.

At present it is a prosperous city, having developed a great many industries. Large foundries, chemical factories and laboratories, distilleries, breweries, candle works, ink works, agricultural and automobile factories and saw mills are very active, and the trade of the district has grown to such an extent that Padua has become the central market of the whole of Venetia.

The city of Padua is about thirty-five miles west of Venice, and double that distance east of Verona, with the Friuli at the northeast and the Tyrol at the northwest, being almost at the center of the horseshoe, which represented the great amphitheater of the Great War.

In twenty minutes, by rail, from Padua, the train reaches Abano, the little city mentioned above as the birthplace of Livy, renowned for its mud baths and medicinal waters efficacious in skin diseases, gout and rheumatism. The city is famous as a watering place, long known to the Romans. The quaint little city lies at the foot of the Euganean Hills where Francesco Petrarca, the poet of love, is buried and where tourists can always find beautiful spots for pleasant excursions. There are eight large establishments in the place for the accommodation of the numerous patients, and some comfortable hotels, well patronized by natives and foreign visitors seeking relief for their ailments.

Eighty miles northwest of Padua, there is another

health resort, the famous spring of Recoaro, surrounded by the Tyrolian Dolomites in a beautiful spot near the end of Val d'Agno. The waters are known for their virtue in any ailment where iron is required to build up a weakened constitution, to restore strength to convalescents from long and serious illnesses. A large establishment, built by the Government, and several private and up-to-date hotels, can accomodate the numerous clientele which patronizes the place.

Padua's churches, museums and galleries are full of art treasures. The most famous of its churches is the Basilica, dedicated to the great St. Anthony, who has been a sacred subject for a multitude of artists. Nicola Pisano designed the church, and Sansovino, with Falconetto, ornamented it. In front stands the colossal equestrian statue of Gattamelata (Erasmo da Narni), General of the Army of the Republic of Venice (1438–1441), by Donatello. This statue is the first great specimen of bronze casting of the modern Italian period of art. A plaster copy can be seen in the Metropolitan Museum, New York.

The library, the archives, the Pinacotheca are also full of old paintings, statuary, and rare treasures of art, among which are some works of Giotto, Paolo Veronese, Tiepolo, Garofalo, Morone, Titian, Boccaccino and many other famous artists.

The university, for which Padua has been and is famous, was founded by Frederick II in 1238, and afterward, under Venice, was governed by three patricians called "Riformatori dello Studio."

A sarcophagus containing the body of the Trojan Antenor (who, according to Virgil, was the founder of

Padua) stands before the university building; inside the building is a court surrounded by some handsome colonnades by Sansovino, erected in 1552, engraved with the names of many distinguished *Cives Academici.* Galileo Galilei taught there for ten years, and there also lectured the great Vesalius, Fabricius ab Aquapendente, Bembo, Scaliger, Tasso, Sobieski, and here studied for many years, under Fabricius, William Harvey, who, from the work of his masters, published the first description of the circulation of the blood, the discovery being afterwards attributed to him. (In the archives of Padua and Bologna are preserved the original works of Silvius, Servetus, Vesalius and Cesalpino on the subject, which give to Harvey the honor of the description.[1])

At present the University of Padua is the center of study for the Venetian provinces, and its surgical clinic is familiar through the popular name of Edoardo Bassini, whose method of operation in cases of inguinal hernia, is well known to every student. His technique is based on the anatomy of the inguinal canal, and the utilization of its tissues for its reconstruction.

Professor Bassini, by reason of his advanced age, has been retired and honored as emeritus for his extensive work as a teacher of surgery and for his many original publications on almost every subject of scientific and practical surgery. His period of professorship has been one of the longest, having succeeded the famous Professor Vanzetti who was called to the University of Kharkoff (Russia) as professor of clinical surgery.

Professor Bassini's contribution to surgical literature

[1]Sir Michael Foster. Lectures on the History of Physiology. Cambridge, At the University Press, 1901.

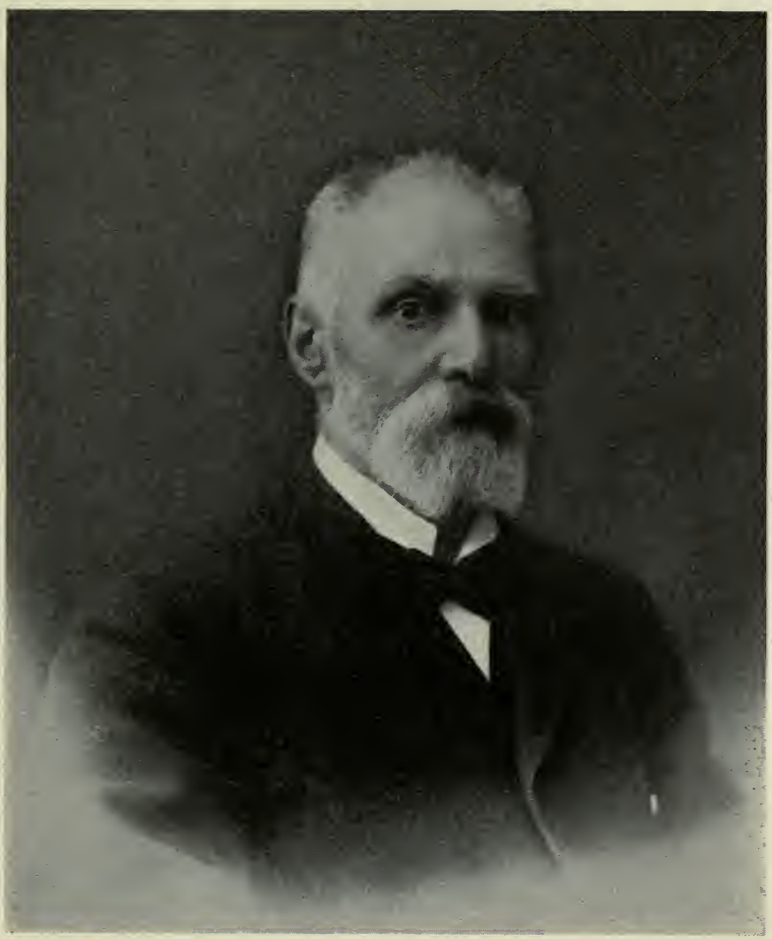
is very large. His masterly descriptions of the "Interscapulothoracic Amputation for Humeroscapular Sarcoma," of "Nephropexy" and "Ileocecal Resection," when such operations were only in their experimental period, are well known among the surgical profession, and rank him as one of the foremost of modern surgeons. His retirement from the chair of surgery is deeply regretted by a great many of his pupils and admirers.

The chair of surgical pathology is held with great honor by a pupil of the University of Rome, Prof. Demetrio Roncali, who wrote one of the largest and most original works on malignant tumors. His publication has been very much discussed and criticized by the scientific world, on account of the importance he attributes to the relation and connection of the blastomycetes and the malignant neo-formations found in the histological study of those neoplasms.

The isolation of the ferments of the malignant neoplasms of the human body, opened up the study of the biological, morphological and pathogenical characteristics of such a microorganism, with the positive outcome from the inoculation in animals. Partisan of the blastomycetic theory, started and evolved in Italy (especially after the investigations of Maffucci, Sirleo, San Felice), Roncali believes that the malignant tumor ought to be considered as a product of infection and inflammation, and the etiology of carcinoma as a manifold parasitic and toxinic process.

Roncali has also published some interesting studies on the pathology of the nervous system, on brain operations and on a new technique for laminectomy.

The surgical department of the University of Padua



Prof. Edoardo Bassini, Padua.

has a staff of young teachers who have distinguished themselves on account of important work and publications on various subjects. Giovanni Velo has published some original notes on pyloric stricture with a technique of combined divulsion, and a special process for the resection of the astragalus. Special observations of Saverio Spangaro on the results of the ligature of the vas deferens are very important, as are those of Ugo Dall'Acqua on varicose veins.

Supported by the Government and by special endowments, the University of Padua has made notable progress. There are at present several new buildings in course of construction, intended for scientific laboratories. The university has over one hundred so-called "Scholarships" for poor students and undergraduates, partly provided by the Government and partly by private endowments.

Chapter XV

THE UNIVERSITY OF PAVIA

FOR fifteen centuries the history of Pavia has been identified with that of the northern half of Italy. Its location at the junction of the two largest waterways of the plain of Lombardy—the rivers Ticino and Po—made it, from the earliest ages, the most important city of the region for strategic, political, and commercial reasons. Yet, this city, the Ticinum of Imperial Rome, the royal residence of Theodoric the Great; "Papia," the illustrious capital from which the Lombard dynasties ruled northern Italy; afterward the capital of the Ghilbelline party, of the royal Fredericks and of Henry VII; the strong, the formidable fortress of the Visconti and Sforza tyrannies of more recent date, has left behind not one worthy monument. This ancient metropolis of marble palaces, this medieval stronghold of a hundred towers, has sunk into a little, sleeping provincial town, with dark, monotonous streets and ugly buildings, inhabited by a population of only 30,000 souls.

In spite of all this, there is, in the tragic evolution of the wonderful history of Pavia, so much to be learned, that every fragment, every stone, surviving from those great epochs, fascinates the imagination of the most apathetic visitor.

The remains of the Visconti Castle, the classic quadrangles of the university, for so many ages the seat and center of Lombard learning, still vibrate with the un-

dying words of Volta and Spallanzani. Imperial Rome still lives in its even rectangularity of narrow streets, and their somber architecture still bears the brutal imprints of the conquering Lombards.

With the domination of Theodoric the Great, we associate the tragic end of Boethius, the author of the "Consolation of Philosophy," written in a prison (one of the hundred towers of Pavia), whose site is still pointed out.

Pavia suffered all the vicissitudes of invasion, war, and destruction, but remained always a center of learning and study. And of these, the best patrons were often those despots who have ruled with iron hands. To Gian Galeazzo Visconti and afterward to Lodovico Sforza is due the foundation of the famous Certosa, built only a few miles from Pavia in the wilderness. This most interesting and magnificent of Italian churches and monasteries, this temple so great, so minute in detail, so brilliant, was commenced in the fourteenth century. The artists were still working at it in the eighteenth century. Yet the labor of four hundred years scarcely accounts for the immensity of its collections of sculptures, carved decorations, works of gold, bronze, ivory, ebony, precious stones, mosaics, frescoes and paintings, and the wealth of art that goes with it.

During the twenty years' reign of Lodovico Sforza, surnamed Il Moro (the Moor), a great many important works were added to the already beautiful church and monastery, and the most celebrated artists of the time were employed. In all the great work that Lodovico did for Certosa and for Pavia, he was constantly advised

and supported by his beautiful wife, Beatrice D'Este, one of the most remarkable women of her time, who died very young and fatally took with her the fortune of her husband, who lost his genius, his power and his liberty.

But this is not the place to recount the glory and the fall of Pavia in the past; the city of today is a prosperous community of about 30,000 inhabitants, very peaceful and industrious.

The University of Pavia naturally had its ups and downs with the political vicissitudes of so many centuries of invasion, war, destruction and reconstruction, until the final barbarous pillage of the French army under Lautrec, in 1527, from which the city never recovered, devastated the country. But, though the country and the city did not recover their previous splendor, the seat of learning remained.

The university was founded by Charles IV, licensed by Pope Boniface IX, endowed by Charlemagne, again very liberally by Gian Galeazzo Visconti and the munificent Lodovico, who raised it to its early pinnacle of greatness. After the ruin of the Spanish era, it was revived by Maria Theresa, who placed in it the splendid new buildings that exist still, and started it upon a new prosperity.

It remained for Napoleon to imitate Lodovico and crown the university with a second climax of aggrandizement, making it the object of the munificent support of the Government. This status modern Italy has maintained, not quite equal to the Sforza days, when it had 3,000 students, and ninety professors, but still the fourth foremost university in Italy, with its huge library of 200,000 volumes and important collections covering nearly every branch of science and art. It

had its splendor in the fifteenth century when the St. Matteo Hospital was founded, and in the sixteenth century when Carcano, Alciato and Leone G. B. Carcano taught, and the two colleges of Ghisilieri and Borromeo were founded by endowment, one with eighty and the other with thirty scholarships. The endowment institutions of Pope Pius v (Ghisilieri) and Cardinal Borromeo (Borromeo) have been working in perfect order since their foundation.

The fame of the medical school of Pavia is indirectly associated with the name of Alessandro Volta, but more directly with that of Antonio Porta, one of the greatest anatomists and surgeons of the last century. Porta was succeeded by another great surgeon and eminent pathologist, Prof. Enrico Bottini, one of the most audacious and perfect technicians of his time, and the surgeon who initiated the use of carbolic-acid solutions in operations long before Lister ever mentioned it.

Bottini's first volume on the surgery of the neck, his numerous operations on the thyroid gland, many publications on laryngotomy and laryngectomy, and the application of an artificial larynx gained for him a world reputation, while a careful study of the prostatic gland and its pathological growth and the ingenious surgical treatment with special instruments (prostatic thermocautery) gave his name to a method which had for a long time remarkable success. This method was quite popular in the various urological clinics of Europe, and was introduced in America by one of the most skillful surgeons of New York (Willy Meyer). Enrico Bottini left a name as a great surgeon, a valuable pathological collection, and a pupil fully worthy of his great teacher.

Prof. Iginio Tansini, the distinguished successor of Enrico Bottini, was for some years director of the surgical clinic of the University of Palermo; he belongs to that throng of eminent Italian surgeons who have brought Italian surgery to so exalted a position. It is almost impossible to give here a synopsis of the numerous original works of Tansini, not only along surgical lines, but also in anatomy and physiology in their relation to surgery. The following publications are worthy of mention: "The Most Important Anatomical Anomalies in Regard to Operative Surgery," "Contributions to the Study of Congenital Goiter," "The Experimental Researches on the Isolation of the Intestine From the Mesenterium," "The Study of Cardiac Impulse After the Opening of the Chest," and contributions to intestinal and renal surgery.

Tansini was the first surgeon in Italy to perform successfully the pylorogastric resection for cancer (1887), and the partial resection of the liver. In 1902 he combined splenectomy with Talma's operation in Banti's disease, and later (1909) performed the same operation in a case of thrombotic splenomegaly with hepatocirrhosis in a patient suffering from ascites. In the same year, he published statistics of 47 nephrectomies, marred by only one death, thanks to his special method. In 1914 he published a paper showing the results of surgical treatment in 14 cases of gastroptosis.

After long and careful observations, Tansini emphasized as an important diagnostic sign, in cases of pyloric cancer, the fact that the abdomen is larger and ascitic when there is a metastasis, while, if the cancer is localized and there is not a metastasis, the abdomen

is very flat and there is no ascites—a very important point in considering the advisability of an operation.

Tansini proposed the cauterization of nervous stumps in peripheric neurectomies, especially facial, for neuralgia, claiming permanent success. He also proposed and described the insertion of the portal vein in the vena cava, with a special method of terminal-lateral anastomosis of the portal stump in that tract of the cava which intercedes between the emulgent and spermatic veins. This proposal was sanctioned in the Clinic by a case operated by Vidal, for the purpose of deviating the portal blood into the cava, in an obstructed portal circulating system.

Well known also is the method of Tansini for the amputation of the cancerous breast, in which, after amply removing the diseased part including the surrounding tissues, he takes a sufficient cutaneous muscular flap from the subspinal region. With this large healthy flap he covers the wound with loose stitches for a first intention healing, making it safe against the cutaneous recidivation which is so frequent in those cases, especially when the flap from the subaxilla is tightly stretched. With his method, the soft pillow-like flap, obtained without impairing the free movements of the scapula and the humeral articulation, leaves a soft, comfortable and painless scar.

The chair of surgical pathology of the University of Pavia is held by a pupil of Professor Durante of Rome, the distinguished Prof. Giovanni Perez, who is the author of some very interesting articles on surgery: "Surgical Complications From the Bacillus Influenzæ," "Staphylococcemia, Pyemic Type, Without Metastasis,"

"Surgical Treatment of Nephritis," "Splenectomy," "A Study of Bone Cysts." Recently he published a very interesting contribution to the surgery of the war for the benefit of young surgeons and students.

For many years the name of Carlo Forlanini, who was professor of clinical medicine at the University of Pavia, has been popular in the medical scientific world on account of his studies and discoveries in the surgery of the chest and the treatment of pleural and pulmonary diseases. Forlanini's death was a great loss to the profession and to the medical school at Pavia, where he left many distinguished pupils.

One of them, assistant to the medical clinic, Eugenio Morelli, free docent in special medical pathology and clinical medicine, following in the footsteps of his great teacher, published during the war, while he was director of a field hospital at the front, a very remarkable work: "The Treatment of the Wounds of the Lungs With Artificial Pneumothorax." This work, published in a moment of such urgent necessity, attracted at once the interest of the military and civil surgeons, who soon adopted his method and his instruments to stay the threatening hemorrhage of the lungs and the impending danger to the injured pleural cavity.

It would be too great a task to translate Professor Morelli's interesting lecture, which was read on January 3, 1917 near the front, when the struggle of the Italian army was most intense. This was published by Army Command.[1] After stating how high is the percentage of mortality in wounds of the lungs, especially in the immediate front line, because of lack of care, he gives

[1]Enrico Voshera, Rome, 1917.

statistics showing death in 25 per cent of the cases in the first line hospitals, because the practice of no intervention was considered more prudent.

The invariable result of a lung wound is hemothorax, which may be rapidly fatal, or in the form of a gradual leak for days. This is due to the great vascularity of the lungs and to the continual moving of the organ in performing its respiratory functions, and, also, because the negative pressure of the pleura acts as a suction pump. To arrest the hemorrhage, the lung has to be immobilized and the suction action of the pleura stopped, to prevent the forming of an empyema by a prompt evacuation of the blood. The danger of an infection is, of course, increased by the blood as a culture field. The danger of pleural adhesions would also be increased by permitting the blood to remain in the lung, which would impair function of the respiration in the future and retard healing. Often the blood is absorbed very slowly; on the other hand, the blood may be absorbed rapidly before the wound is healed, and by a sudden dilatation of the lung another hemorrhage may be threatened, a danger which may also arise from a rapid absorption of the spontaneous pneumothorax.

Morelli contradicts the opinion that the blood may be left as a compressor of the lung, observing that the liquids are not liable to a proper distention and in consequence not adapted to the immobilization of the lung. The usual thoracentesis with Potain's aspirator is very dangerous, as it favors the tearing of the lung with a consequent new hemorrhage.

Morelli has invented a very simple instrument with

which the thoracentesis can easily be made. This allows the substitution of the gas to the blood, producing a pneumothorax instead of a hemothorax, thus avoiding the dangers of a hemothorax while keeping the lung compressed by a constant refilling of the cavity as is done in therapeutic pneumothorax in cases of tuberculosis of the lung (Forlanini). In case of wounds, the lung can be compressed by sterile air and the compression maintained for three or four weeks.

Morelli applied this method in many cases; in 40 cases of immediate intervention recovery resulted in about four weeks. Usually only light pressure is required to obtain the arrest of the pulmonary hemorrhage, and the procedure is very simple and safe.

Morelli asserts that in every case of wound of the lung, it is better to encourage the formation of the pneumothorax, for, with the compression of the lung and the elimination of the pleuritic air suction, the hemorrhage is controlled. It must be borne in mind that if a thoracic wound is left open, such intervention is not possible.

Morelli also presented and described an instrument for the evacuation of a pyothorax and the irrigation of the pleura while maintaining the lung compressed.[1]

Before closing this brief article on the University of Pavia, mention must be made of some of the men already familiar to the scientific world, like Camillo Golgi, professor of histology and general pathology, who is celebrated for his important work and discoveries in nerve cells and corpuscles, in chromo-argentic reaction on nerve cells, and for his Nobel

[1] *J. de méd et chir. prat.*, Par. 203.

prize, received in 1906; and Scipione Riva-Rocci, professor of pediatrics and special medical pathology, who is well known for his studies on blood pressure and is the inventor of a well-known instrument for that purpose. These men are a credit to the flourishing school of medicine and surgery at Pavia.

Chapter XVI

SCIENTIFIC INSTITUTES OF LEARNING IN MILAN

MILAN, the capital city of Lombardy, like Florence, the capital city of Tuscany, has no university. Like Florence, which received Pisa and Siena as an inheritance and a tradition of the past, Milan received Pavia as an inheritance and traditions of centuries of glorious history which could not be effaced or forgotten. And so it is, that the splendid Ticinum of Imperial Rome, the royal residence of Theodoric the Great, the magnificent "Papia" of the Lombard dynasties, the city of one hundred towers of stately palaces and gorgeous churches, the seat of the most sumptuous courts of many kings and emperors, the coveted prey of barbarians, the field of terrible battles, of slaughters and devastations, reduced from the princely city of the Viscontis and the Sforzas to a small provincial town of mediocre importance, maintains the only heraldry left to the pride of a fallen dominion. Reverence for such traditions and homage to the illustrious men who kept high and honored the glorious name of that university, prevented intellectual Milan from destroying the only pride left to the great city of the past.

But if Milan has no university, it has something very similiar in "Gli Istituti Clinici di Perfezionamento," which have grown with the wonderful growth of the great city. It could not be otherwise, for Milan, today, represents the intellectual, commercial and industrial

center of Italy, while Pavia, although only twenty-two miles away and connected with the big city by excellent roads and the famous canal, is only a small, industrial and agricultural town.

The idea of having in Milan some institutes for the purpose of coupling scientific studies with practical application, had been ventilated many years ago, especially in regard to the medical profession. The annals of the Ospedale Maggiore mention a course of surgical lessons delivered by Cristoforo Inzago in 1634, followed by Felice Calvi in 1687, when a regular school of surgical anatomy was founded by the board of directors of the Ospedale Maggiore with the following announcement:

> Considering that the practical teaching of medicine and surgery is based on the exact knowledge of the human body, and that such knowledge cannot be acquired in the brief time of the University's studies, the board of directors of the Ospedale Maggiore, taking advantage of the large quantity of human bodies of which it can dispose, has decided to open a course of anatomy applied to surgery.

Following is a list of names of the teachers who held the chair of anatomy applied to surgery at the Ospedale Maggiore of Milan:

Antonio Carnelli (1687–88); Battista Ribotti (1688–99); Paolo Gerolamo Biumi (1699–1724); Alessandro Sacco (1724) and again Biumi (till 1728); Gaetano Canavesi (1728–34); Girolamo Crivelli (1734–42); Giovanni Battista Senna (1742–47); Guglielmo Patrini (1747–1786). After 1790 the surgical school was under the leadership of a famous anatomist, Giovanni Battista Monteggia and the surgical clinic under another famous man, Gaetano Strambio (1806).

But the fall of Napoleon, brought back the Austrians, who destroyed all the good work and steady progress under Professors Palletta, Monteggia, Rasori, Strambio and many other well-remembered teachers.

From the time of the restoration of the Austro-Hungarian Government (1818) to that of the liberation of Lombardy and its union to the new Italy (1859), nothing had been done for the surgical progress of the Ospedale Maggiore, and not until the political administration of the new government of Italy was well settled, was it possible to resume the interrupted work.

Ten years later (1869) the school of anatomy was reorganized under Professor Albertini, and soon after several prominent professional men, among whom were Gaetano Strambio, mentioned above, Malachia de Cristoforis, Gaetano Pini, Pietro Panzeri, Edoardo Porro, Andrea Verga, were called upon to advise the proper means for a permanent consolidation of the Istituti Clinici di Perfezionamento.

A large endowment from Siro Valerio, a wealthy philanthropist, started a new era of activity among the most prominent professional men of Milan, headed by a very energetic and ambitious leader, Prof. Luigi Mangiagalli. After careful consideration a plan was completed by a special committee selected by the municipal board, which in 1901 laid the foundation of the "Scientific Institute for Study in the City of Milan." From that time, thanks to the large and numerous endowments, dates the rapid growth of the branch, Istituti Clinici di Perfezionamento, which for equipment and efficiency are at present second to none in the world.

The Istituti Clinici di Perfezionamento started by

improving the obstetric and gynecologic institute, which had been in operation for many years and was supported by special endowments from the city and by private gifts. Attention was next directed to the institute for cripples of which mention has been made in the special article—"Institutes for Crippled Children in Italy."

A remarkable branch of the Istituti Clinici di Perfezionamento is the well known clinic for occupational diseases, which was planned and founded by the Labor Party of the municipal board, the head of which (then Mayor Mussi), at the inaugural speech, said:

> This clinic will be especially devoted to the study of occupational diseases, familiarizing practicing physicians with the subject. It will shelter for diagnostic and therapeutic purposes the workingmen under observation for suspected infirmity, or those already afflicted by some occupational disease, so as to keep under control the health condition of all the workingmen employed in the various industries, and especially those working under insanitary conditions.

It is with pleasure that we take from the *Survey*[1] an article written by John B. Andrews, secretary of the American Association for Labor Legislation:

> Some of us had hoped that industrial America, with its wonderful resources, its famed philanthropies, and its uncounted thousands of work-diseased men and women, might be first among nations to recognize the need of a special hospital and clinic for industrial diseases . . .But the honor belongs to Italy.
>
> Eight years ago a group of social-minded medical men in Milan, united in a demand for systematic study of diseases of occupation.
>
> Four years ago they called together from many nations, the first International Congress of Industrial Diseases; last March they saw the hopes of years culminate in the dedication of the first Labor Clinic.

[1] November, 1910.

"For the Scientific Study of Prevention of Occupational Diseases" is the inscription in letters of gold on a background of white marble over the entrance of this unique hospital.

Three large four-story buildings, new and well equipped with the latest scientific apparatus in laboratories, hospital wards, lecture rooms and library, are here frankly dedicated to the elimination of those diseases peculiar to industrial employments.

Already twelve scientific men are cooperating with the director, Dr. Devoto, although the laboratories were not opened until March 20.

In one of the hospital's wards the director is giving special attention to fourteen patients. One of these, a man trembling with the peculiar palsy due to mercurial poisoning, began work in a hat factory when ten years of age and felt the effect of the poison almost immediately.

Another patient suffers with lead colic, the result of his work as a house painter. Seven of his thirteen children died during the first few months after they came into the world, on account, perhaps, of the presence of poison in the father's system.

Other patients are being treated for ills occasioned by work in high temperatures, in dusty or poisonous atmospheres and from the results of overstrain.

The laboratories too are fully equipped.

Here we find treadmills in which dogs patiently trot up endless hills in order that their blood corpuscles may disclose new truths concerning the toxin of fatigue. Machines register on revolving disks the fluctuating curves inscribed by long series of muscular strains, in order that the effects of overwork and artificial stimulus may be correlated with immunity from disease.

Here, too, "leaded" mother goats and guinea-pigs add to our fund of knowledge concerning the effect of lead poisoning upon premature birth and the supply of mother's milk.

These experiments, moreover, are of much more than ordinary laboratory interest.

A practical provision extends the activities of the clinic into industrial establishments, and supplements the work of Government factory inspectors.

Clinic for Occupational Diseases at Milan.

Dr. Carozzi, who has devoted much time to this important work, is fully supplied with portable air-test devices. When called upon by the department, he is authorized to enter the establishment to inspect sanitary conditions.

These practical experiments carried on with a broad scientific devotion to the conservation of human resources, offer both encouragement and reproach to us in the United States.

What have we of equal value to offer the sons and daughters of Italy, whom we invite to our shores? Country dentists have confessed to us that they were merely "experimenting" with match-factory employees afflicted with the dreadful phossy jaw.

Industrial diseases of many kinds are leaving pitiful wrecks to burden and shame us.

Is it not a matter of reproach that it was not in weary smoke-begrimed Pittsburgh, nor amid the textile mills of New England, nor among the mines and smelters and factories of the great industrial centers of the United States, but beneath the sunny skies of Italy that this need found tangible expression in the first clinic for industrial diseases?

When Florence Nightingale and Henri Dunant saw the battlefield strewn with dead and wounded, they gave a moment of thought and then passed on to the world an idea which grew into that beneficent organization known as the Red Cross.

Since that time wherever men might be injured in the activity of war the means for quick relief have been supplied.

During the same half century, however, the industrial field with its activities of peace has extended and grown more mechanical, until it maims now more men than war ever did.

In the United States we are just beginning to realize that 30,000 wage earners are killed by industrial accidents every year, and that at least 500,000 more are seriously injured.

And now, carefully prepared by a committee of experts, appointed by the President of the Association of Labor Legislation and thoughtfully received by the President of the United States, comes a memorial on industrial diseases, which discloses industrial injuries of still greater magnitude.

In this admirable memorial of facts and figures, we learn that

in the United States there are probably no less than 13,000,000 cases of sickness each year among those engaged in industrial employments. The money loss each year (for those who find dollars more impressive than lives) is calculated by these conservative experts at nearly three-quarters of a billion dollars. At least one-fourth of this painful incapacity for work and consequent economic loss, we are told, can be prevented . . .

The appreciation of the Secretary of the American Association of Labor Legislation was a fine and just compliment to the original enterprise of the Labor Party of Milan. But the activity and energy of the people of Milan have not been confined to a party, for, under the indefatigable leadership of the eminent Prof. Luigi Mangiagalli, endowments and appropriations were solicited and obtained, so that the administration of the Istituti Scientifici was able to enlarge its sphere of work, and select an efficient staff for the various clinics as follows:

Divisions	*Special Institutes or Clinics*	*Professors*
Obstetrics-Gynecology	Institute and Hospital	Luigi Mangiagalli
Industrial Diseases	Labor Clinic	Luigi Devoto
Clinical Anatomy	Main Hospital	Ferdinando Livini
Orthopedic Clinic	Institute for Cripples	Riccardo Galeazzi
Epidemic, Contagious Diseases	Hospital for Contagious Diseases	Giovanni Polverini
Traumatology	Ponti's Ward Main Hospital	Baldo Rossi
Social Medicine	Main Hospital	Edoardo Bonardi
Physiopathology and Experimental Therapy in Infections	Institute of Serum Therapy	Serafino Belfanti
Public andIndustrial Hygienics	Special Clinic Institute	Ernesto Bertarelli
Special Dental Pathology	Stomatologic Institute	Gaetano Fasoli
Dental and Periodontal Surgery	Stomatologic Institute	Camillo Rovida
Dental Prosthesis	Stomatologic Institute	Carlo Platschick
Conservative Odontotherapy	Stomatologic Institute	Lodovico Couillaux

Hospital for Contagious Diseases at Milan.

To the regular official course of lessons must be added free lecture courses as follows: Medical History (Prof. Piero Giacosa); Neuropathology (Prof. Eugenio Medla); Gastrointestinal Surgery (Professor Clavini); Dermosyphilography (Professor Pasini); Urology (Professors Lasio and Sigurta); Criminal Anthropology (Professor Del Greco); Pathologic Anatomy (Professor Zenoni).

Milan has at present a splendid post-graduate school system, and there, in the great metropolis of commerce, industry and activity in every branch of enterprise, a doctor finds ample field for perfecting the knowledge he has acquired in a university, turning it into practical application.

Milan claims among its distinguished surgeons several men celebrated in the profession for their contributions to surgical literature. All distinguished themselves for efficient services during the Great War. Among them were Prof. Baldo Rossi, director of the so-called "movable hospital" at the front; Prof. Andrea Majocchi, known in America for his enthusiastic publications on American surgery; and Prof. Riccardo Galeazzi, already mentioned, whose numerous publications are a credit to his very enterprising activity.

The growth of Milan in the last twenty years has been marvellous. Its topographic position in the center of the most fertile province of northern Italy, its geographic location, which made it the emporium for the trade between the Mediterranean, with its port of Genoa in the south, and Switzerland, Bavaria, Austria and the northern states, gave it an impetus of prosperity worthy of the energy of its citizens. The Milanese are

trying to make it also a center of intellectual advancement, as it is already of industrial and commercial progress. Two mountain railroads further its commercial communications—the St. Gotthard, and the Jura-Simplon Railways.

Milan is only a few miles from the great Italian lakes and is near all the best mountain resorts of the Alps. It thus became the natural headquarters for many interesting excursions. As a result, there was founded a most active organization, "The Touring Club of Italy," one of the best frequented and patronized institutions of the country.

Less than fifty miles north, near the pretty city of Bergamo, there is a famous health resort (for stomach and intestinal diseases), which combines both the climatic and medicinal properties of the spring, producing most wonderful cures. San Pelligrino is a well-known resort, well equipped with commendable establishments and comfortable hotels and surrounded by beautiful country.

Chapter XVII

THE UNIVERSITY OF TURIN

NO Italian would or could deny that Turin has been the cradle of the unity of Italy, that the little kingdom of Piedmont was the first to have a liberal constitution, which the people demanded in 1847, and which Carlo Alberto of the house of Savoy conceded in 1848, when at the head of a small army he dared to challenge the most powerful army of the most powerful empire of that time—Austria-Hungary. History has recorded that fatal campaign of 1849, when another army of Piedmont, reinforced by the lovers of liberty of all Italy, attacked the big army of Austria, and was defeated at Novara. But the people did not renounce the aspiration of a free Italy. In 1859 a fortunate campaign gave Lombardy to Italy, and in 1860 the kingdoms of Naples and Sicily became free, thanks to the courage and audacity of Garibaldi, the idol of Italian independence.

From Turin, the great Cavour, seconded by Victor Emanuel II, the chivalrous king, cleverly directed the difficult political muddle of that time and prepared that unification of Italy which was the poetical dream of Dante, and later, the practical dream of Mazzini. For many years, Turin was the center of political conspiracies of patriots gathered from all over Italy, exiled by the Austrians, Neapolitans, Tuscans, and by the small princely rulers who feared the loss of their thrones.

In the turmoil of political agitations and during the period of transition from the antiquated system of education to the modern liberal ideas, study at the university was somewhat neglected, not for lack of superior men as teachers, but on account of the general restless condition of the minds of the younger generation, almost continually excited by patriotic events.

Turin, the capital of Piedmont, is a delightful city of about 500,000 inhabitants, built along the left border of the River Po, which runs at the foot of a chain of most picturesque hills, The elevation is covered with numerous and elegant villas, as far down as the famous Basilica of Superga where are the tombs of the kings and princes of the house of Savoy. Opposite the chain of hills, which is in the south of the city, far away to the north, appears, in the form of an amphitheater, the chain of the majestic Alps, some covered by perpetual snow. Although of very ancient origin, rebuilt with modern design and taste, Turin has beautiful wide streets, with elegant parks, one of which, the Valentino, has an historical castle built on the edge of the river, surrounded by luxurious gardens. Many squares artistically laid out are adorned with fine monuments in bronze and marble, and long boulevards planted with beautiful trees are the pride of the city.

Turin, during the early period of the formation of Italian unity, in the middle of the last century, was the intellectual and political center of the country. But after the removal of the capital to Rome, Turin lost its political importance and became the active center of industrial enterprises, excelling in cotton-goods factories, in mechanical products, and especially in

automobile manufactures—for instance, the well-known "Fiat," one of the best machines of its kind in the world.

The university, which is considered one of the best in Italy, was founded in 1404 by Pope Benedict XIII. After many vicissitudes due to long periods of war, it reached its most splendid epoch under Victor Amedeus II and later under Carlo Emanuel III of Savoy, king of Sardinia (1771). Under the French Republic, and the Napoleonic Empire, it was well endowed, and gained an important place after the unification of Italy. King Carlo Alberto, toward the middle of the last century, founded a college which bears his name. He established one hundred gratuitous tuitions. Thirty-five were afterward added, by private contributions, for worthy students without means.

The University of Turin possesses also a Royal Academy of Medicine founded in 1838. This has a large library of 120,000 volumes, with 50,000 pamphlets, and 120 monthly and weekly reviews, publishing besides the *Journal of the Academy of Medicine*, which has reached its one hundred and fiftieth number.

The school of medicine of the University of Turin has been renowned throughout the world for its two anatomists whose discoveries are recorded with their name: Luigi Rolando, who described the area, convolution and fissure of the brain; and Carlo Giacomini, who described the grayish band of the fascia dentata of the hippocampus. Both these anatomists, during their period of teaching in the last century, left numerous publications of great value, holding aloft the reputation of a school of anatomy which has been and is yet considered one of the best in Italy.

In the last score of years several buildings have been constructed for the scientific institutes of physiology, normal anatomy, pathology (anatomic and surgical), and others intended for the various branches of medicine and surgery. Those already connected with many of the hospitals have been properly improved and equipped with modern appliances so as to fit them for modern research.

The institute of surgical pathology was directed, until last year, by Prof. Daniele Baiardi, who, on account of the age limit, was compelled to retire, much to the regret of the faculty and his faithful pupils. Unfortunately very little is known of the numerous publications of Prof. Daniele Baiardi, for few have been translated from the Italian. His original and interesting studies on bones, and his experiments on the formation of callus in cases of fracture of long bones (1879), are most valuable and complete. These were followed by some other experimental studies on neo-formation of bony substance in the medullary canal and in the epiphysis, and on the regeneration of the medulla of the long bones. Many other works of as great importance were the result of his experimental studies; as for example, his contribution on the formation of neo-arthrosis in traumatic luxations, and on the regeneration of the articular joints in subcapsuloperiosteal resection (1882). Other publications to his credit are on vaginal primary sarcoma, varicose veins of the right arm, infantile congenital stricture of the jaws, and primitive muscular angioma (1901)—all of which gave him the well-deserved reputation of a conscientious student and learned pathologist.

The surgical clinic is under the direction of one of the most clever surgeons and learned teachers of surgery of which Italy can boast—Prof. Antonio Carle, who recently (1912) built at his own expense, the surgical institute for diseases of the stomach and the intestines, attached to the Hospital Umberto 1, of which he has been the clinical director for a great many years.

L'Ospedale Mauriziano Umberto Primo, as it is called, is a model of modern hospitals and a credit to the city of Turin, but especially to Professor Carle, who with indefatigable activity has kept it to the highest up-to-date standard. Professor Carle was the first, in conjunction with Dr. Rattone, to discover the Bacillus clavatus—the tetanus germ (afterward described by Nicolaier), and to demonstrate the possible transmission of the dreaded disease.

In a work published in collaboration with Professor Fantino, his assistant (in 1898), Professor Carle illustrates by means of important and remarkable statistics the success in gastric surgery, especially in the early period of stomach operations. In 1899 he published "A Contribution to the Surgery of the Thyroid" with extensive statistics on the operation for goiter, and shortly after, "A Contribution on the Operative Treatment of Fibromyoma of the Uterus With 979 Cases." He also contributed notably to our knowledge of surgery of the kidneys and biliary organs.

One of the greatest merits of Professor Carle, beside his recognized scientific achievements and his known ability as a successful surgeon, is his excellence as a teacher. Many of his pupils occupy some of the most

coveted positions as professors of surgical clinics and directors of hospitals, which must be a great satisfaction to a man who has devoted all his life to scientific studies and the practical application of his learning to the advancement of surgery.

The city of Turin has several important hospitals, operated especially as charitable institutions, with a few rooms for the accommodation of private patients who can pay for attendance and treatment. Some of these hospitals are built according to the latest requirements of science. Others have been remodelled; all of them have modern operating rooms, and most of them are equipped with the latest *x*-ray apparatus, indispensable to modern medicine and surgery.

The San Giovanni Hospital deserves special mention. This is the largest and oldest hospital in the city, but has been remodelled to suit present-day progress. Two prominent surgeons direct the principal sections of the San Giovanni—Prof. Luigi Bobbio, who distinguished himself during the Great War as a major in the Medical Corps, and Prof. Valentino Oliva. Professor Bobbio, who is a free docent and assistant to Professor Baiardi, is the author of an elaborate contribution to surgical literature, in sixty pamphlets, on almost every subject of surgery. In one of the pamphlets he summarizes the clinical work of ten years. It is almost impossible to give a fair criticism of such an extensive work, but certainly some of his contributions are highly commendable for their originality and the clear exposition of the cases.

Able assistants to Profs. Antonio Carle and Daniele Baiardi, distinguished for their work and publications, are the free-docent Profs. Lodovico Isnardi; Giovanni

Battista Boccasso; Giuseppe Serafini; Candido Mantelli; Ottorino Ufferduzzi; Andrea Marro; Lorenzo de Bernardi; and Ugo Camera.

Several summer resorts in the mountains can be reached from Turin, a few of them with springs of well-known reputation for stomach and skin diseases, like St. Vincent and Courmayeur in the valley of Aosta. One of the most famous springs since the time of the ancient Romans is the boiling sulphurous water of Acqui. Near each of these springs and resorts there are several comfortable hotels; the Acqui spring is situated in a very interesting agricultural city, three hours by rail from Turin. Acqui has two large and well-equipped establishments for sulphur and mud baths, renowned for their efficacy in rheumatic affections, especially of the joints.

Not far from Turin, there are two well-known and well-patronized establishments for medicated baths, well equipped with modern conveniences and comfortable hotels. Both establishments are on the railroad line, Torino Cuneo, whence they can be reached by tram cars and buses. Both are renowned for the so-called "hot mud," applied over rheumatic articulations with wonderful effect. The country around is also very attractive for mountain excursions and for sport.

Chapter XXIII

THE UNIVERSITY OF GENOA

GENOA is called "La Superba," according to some historians, on account of its superb position, but perhaps, also, on account of the very proud disposition of the inhabitants, who are very exclusive and rather aristocratic in social intercourse, although very liberal and democratic in ideas. But whatever may be the right reason, the epithet fits well, for there are few cities in the world built with such superb palaces, standing artistically disposed along the side of the high hills which surround the marvellous gulf that nature seems to have made for a safe landing and shelter of ships. History has written in golden letters the names of Cristoforo Colombo, Andrea Doria and Giuseppe Mazzini, among many other celebrated men in the navy and army, in politics, literature, art and trade, which made Genoa famous in the far and near past.

The date of foundation is rather obscure. For a long time it was thought to have been originally a Roman colony. However, in recent excavations for the construction of the new Via Venti Settembre more than eighty tombs of Greek origin, dating from the fourth or fifth century B.C., were found, which prove that Genoa had been colonized before the Romans, who came only in the second century B.C., and restored it after its destruction by the Carthaginians.

Genoa followed the rest of Italy in its vicissitudes

under French and German invasions and jealousy. It was divided into Guelph and Ghibelline factions, and suffered internally by continual disputes between the nobles and the commoners.

The common danger of the Saracens made Genoa strong as a naval power, and from that she extended her colonies in the Orient, along the Spanish coast and the coast of Barbary, enlarging her possessions on the Black Sea and along the Euphrates.

One of the most remarkable features of commercial Genoa is the famous "Banco di San Giorgio," an institution founded in the fourteenth century, which financed all the big Genoese enterprises during the zenith of Genoa as a republic, and terminated with the conquest by Napoleon in 1796. The palace remains as a national monument of one of the most flourishing banking institutions of the Middle Ages and of the commercial power of Genoa.

Modern Genoa is a beautiful city of about 300,000 inhabitants, considered the most active and most enterprising in the whole country. Its splendid port has been greatly enlarged by the Government and with the generous contribution of several millions from Duke de Ferrari Galliera, who also left a large estate for a hospital which goes under the family name. Other great improvements have been and are continually being added to this magnificent port which is the most important on the Mediterranean Sea, commanding the principal trade with North and South America and the whole oriental coast. Annexed to the port is a large and famous shipyard, named "Ansaldo," after the founder. Here many large ships

are launched for commercial purposes, and 50,000 men find continual and active occupation.

The University of Genoa is perhaps the youngest of the Italian universities, as only in 1773 were the special subjects, previously taught separately, combined in one organization.

When Napoleon, to ingratiate himself with the inhabitants of Genoa, established a regular university in 1812, the school of anatomy was the first to rise to particular reputation. The father of Giuseppe Mazzini, the great Italian patriot, held the chair of anatomy from 1816 to 1844, inaugurating the Anatomical Museum, where today some interesting preparations left by Prof. Giacomo Mazzini and his assistant, Giuseppe Locatelli, may be admired.

As successor to Giacomo Mazzini in 1844, came Prof. Cristoforo Tomati, who gave to the school a new scientific basis and impulse, in consonance with the progressive times. He started his lectures with the comparative embryological and histological method, well assisted by his worthy pupils, Luigi Ageno, Torquato Beisso, Minaglia and Sivori, beside a private anatomist, Giuseppe de Negri, who left some original publications on the anatomy of the inguinal and crural regions in reference to the hernia of those parts.

In 1859 Professor Tomati was called to the University of Turin. He was succeeded by Luigi Ageno, who published several very important studies:

1. De Folliculis Interstitialibus et Gangliis Mesentericis, et Speciatim De Eorum in Febre Tiphoide Lesionibus.
2. Anatomic Science Considered in the Principal Epochs of Its History.

3. The Combined Anatomicophysiologic Studies and Medical Science.

Many other publications from Prof. Luigi Ageno remain as contributions during his thirty years of tuition, after which his successor, Torquato Beisso, in his short period of professorship, left some important studies on the medulla and the encephalon.

After Professor Beisso, Pier Michele Guerica held the chairs of both descriptive and topographic anatomy, publishing a great many important works, especially on the nervous system of the hand, and on the muscles of mastication. At present the professor of both descriptive and topographic anatomy is Pilade Lachi, assisted by Carlo Ganfini, special lecturer on embryology.

In 1885 the University was organized on the lines of the other Italian universities, with complete courses of study, and with special buildings and laboratories.

The school of surgery of the University of Genoa, during the last half century, has been graced by two very prominent surgeons and teachers, Azzio Caselli and Giacomo Filippo Novaro. Of Azzio Caselli's long period of teaching there remains an extensive contribution to surgery on almost every subject, from brain surgery, amputation of the tongue, experimental studies and their application in stomach and intestinal surgery, resections of the knee and elbow, to practical surgery of the larynx and thyroid gland.

Giacomo Filippo Novaro, who followed Professor Caselli in 1898, was, for several years, previously, head of the surgical clinic of Bologna, where he had succeeded Pietro Loreta, the eminent surgeon who died in 1895. It would be difficult to review, even in part, the great

and valuable work of Professor Novaro during his long period of teaching at the University of Turin, at that of Siena and afterwards at Bologna and Genoa, whence, on account of the age limit, he was retired only last year.

Well known are Novaro's experimental works on the resection of the intestine (early in the 1870). He was the first in Italy to resect the esophagus for cancer by esophagoplasty (1872), the second case after that of Czerny. His modifications in laryngectomy, gastro-enterostomy, cholecystectomy, typhlostomy, the radical cure of crural hernia by a special method, with a flap of the pectineus, and many other original studies, which mark a real progress in scientific and practical surgery, are well known.

Although a great scientist, in his lectures Novaro always tried to explain the practical side of surgery for the benefit of the majority of the pupils, whose careers were to be along the lines of practical work. For the same reason he insisted on special care in accurate diagnosis. During the Great War, he was honored with a generalship, his special work being that of an efficient organizer, well appreciated in the urgent need for practical men.

There are few topics of clinical and operative surgery that Novaro has not studied, discussed and often modified with original and modern views. He was one of the first in Italy who contributed to the surgery of the neck, thorax and abdomen. In laryngectomy he was, for that early time, daring and technically perfect. He devoted much time to the study of diseases of the intestinal tract, and early performed pyloric divulsion, pylorplasty and gastro-entero-

Prof. G. F. Novaro, Genoa.

anastomosis. In 1890 he published "A Contribution to Gastric Surgery" in which he reports the details of his operations.

Novaro also published cases of nephrectomy, extirpation of the gasserian ganglion for neuralgia, resection of the intestine, operations on the pancreas, and on the spleen. He proposed typhlostomy for the treatment of ulcerative colitis (1887); introduced into Italy carpectomy with the dorsodigital method of Studegard; and published a very important work on transfixing the uterus to the bladder through the peritoneum, or grafting both to the large intestine, and on the extirpation of the bladder and the prostatic gland (1887).

The work of Professor Novaro has ever been inspired by the highest spirit of modernism and progress, and he deserves credit in having transmitted such noble ambition to all his numerous pupils.

Independent of the clinic of the university, is the "Institute of Operative Medicine" directed by Prof. Attilio Catterina, who, besides many cases on the anatomical pathology of tumors, has to his credit some important cases of clinical operations. He popularized the method of carpectomy with a longitudinal method which goes by his name, together with many other original methods in the surgery of articulations.

One of the most distinguished pupils of Novaro was Prof. Ernesto Bozzi, teacher of special surgical pathology, a promising pathologist who for fifteen years directed the Institute at the University of Genoa and who fell a victim in the recent war, while serving as major at the front, in consequence of an enteritis followed by acute pneumonia. Professor Bozzi left

some capital contributions on the pathology of the thyroid, the rehabilitation of the functions of the hydronephrotic kidney, cholecystenterostomy, fungoid mycosis, and many other important studies. Not long before his death, in a splendid conference at the Congress of Bologna, and later, in Geneva, he exhibited his notable successes in abdominal surgery during the war, advising a prudent and early intervention.

Bozzi's name must not be confused with that of Luigi Maria Bossi, professor of gynecology, who had a period of fame because of his instrument for quick, forcible uterine dilatation, and who also died a few years ago.

The surgical faculty of the Institute of Operative Medicine had on its staff, Prof. Erasmo de Paoli, who previously was professor of clinical surgery at the University of Perugia, leaving there a record of good and efficient teaching and several publications on arthrectomy of the knee, nephropexy, resection of the kidney, strumectomy and other original work.

Genoa is favorably situated on the shores of a large gulf with the famous Riviera, "di Levante" (or Western Riviera) and "di Ponente" (or Eastern Riviera). Travellers are familiar with both these winter resorts all along the coast, for hundreds of miles famous for the balmy weather on both sides, and for beautiful towns with splendid hotels, well known the world over.

Well known the world over are also the names of Nervi, only a few miles east of Genoa, Santa Margherita, Portofino, Rapallo, Chiavari, Spezia, so dear to the tourist, as well as the west coast, beginning from the renowned and pretty town of Pegli, following along to Arenzano, Savona, Albenga, Alassio, Diano-Marina,

San Remo and Bordighera, near Monaco and Nice. These are all famous resorts, where sea bathing is well patronized for half of the year and where the balmy weather, so beneficial to lung troubles and weak constitutions, is recommended for the winter season.

In the middle of the last century a philanthropic physician started what in Italy are called the "Ospizii Marini" for children, with the scope of sending to the seaside those poor, delicate beings who could not afford the benefit of the sea air and salt water cure so efficient in many diseases. The Ospizii Marini are today a flourishing institution supported by private subscriptions, and patronized by a great many ladies of the best social standing, who personally take charge of conducting parties of fifty children at a time, to those sea resorts where properly fitted houses have been built with the charitable contributions of people of means. The successful results of such treatment have been marvellous, so much so that with similar success another institution was started later with the purpose of combining the seashore and mountain treatment.

There are on the Riviera also, several establishments for heliotherapy, the treatment of diseases by exposing the body to the sun's rays. This therapeutic use of the sun-bath has acquired public favor of late. Well managed and properly applied, heliotherapy has given some remarkable successes, and there is no doubt that there is a great future for this modern therapeutic treatment.

Chapter XIX

THE UNIVERSITY OF PISA

PISA of today, a peaceful, quiet, provincial town of about 70,000 souls, does not look like the city which a thousand years ago was the birthplace of proud and intrepid crusaders who proved their valor at the capture of Jerusalem. History further recalls the great power which the Pisans acquired in wars with their neighbors, the Lucchese and the Genoese, and with the Moslems, who had invaded part of Europe. It was in the year 1115, that a fleet of three hundred sail, commanded by Archbishop Pietro Moriconi, defeated the Moslems, strongly intrenched in the Baleari Isles, liberating a score of Christian prisoners. History likewise recounts the long struggle with the republic of Genoa, rising to a period of wealth and prosperity, of which abundant monuments remain today in the magnificent churches and palaces and precious objects of art.

The wealth of Pisa, the ambition of its inhabitants, the jealousy of its neighbors, kept the republic in a continual state of war with its rivals, Lucca, Genoa and Florence, until the defeat of the Ghibelline party (which Pisa had joined and always supported) and the death of Corradino, its sponsor, not only started the decline of the Pisan supremacy, but prepared its final ruin with the loss in 1284 of the battle of Meloria, in which Genoa crushed forever its rival. A brief spark of old glory returned in 1315, with Uguccione della Faggiuola, and

later on (1328) with Castruccio Castracane; but they were sparks of a dying power.

Could Dante see Pisa today, he would not think the Pisans as bad as he considered them in his thirty-third canto of the "Inferno." On the contrary, he would find the noble Tuscan city a peaceful, industrious and prosperous community which, in the last twenty years, has almost doubled its population. Industries of many kinds, especially of cotton goods, have increased its population and its wealth, and, since with Italy united there will be none of the old rivalry with Lucca, Genoa, Florence or Siena, its industrial development and progress will be uninterrupted in the future.

Few cities in the world can boast such an honor as the birth of Galileo Galilei, who in his youth studied and taught in his native city.

Few universities of Italy have had so many ups and downs as that of Pisa since its foundation in the twelfth century. But after the final annexation to Italy in 1859, it began to revive, and in 1880 its medical school was reorganized on a basis equal to the other Italian schools.

The names of Vittorio Aducco (physiologist), Guglielmo Romiti (anatomist), Giuseppe Guarnieri (bacteriologist), Guido Ferrarini and Rinaldo Cassanello (special surgical pathologists), and above all that of Antonio Ceci (professor of clinical and operative surgery), all well known in the scientific medical world not only in Italy but in all Europe, are sufficient authority for the very high standing of Pisa's surgical school.

The surgical clinic of Pisa, in fact, is one of the most complete and well equipped in Italy, and its director,

Prof. Antonio Ceci was one of the most efficient and active teachers known, particularly for his valuable participation in every surgical congress. His large contribution to the literature of surgery includes some original work on "The Metallic Suture of the Patella" (1887), "Splenectomy" (1894), "Removal of the Sac in Popliteal Aneurysm" (1808), "The Original Proposition of Ligating the Internal Jugular in Cases Where the Primitive Carotid Has to be Ligated, with the Purpose of Maintaining the Endocerebral Equilibrium."

Professor Ceci devoted his talent especially to plastic surgery, in which he had remarkable success, and as far back as 1900 he adopted and practiced the original method of Vanghetti for cinematic amputations, utilizing the muscular stump as loops for future prosthetic applications. At the Surgical Congress of Bologna (1917) he strongly upheld the original ideas of Vanghetti as practically and successfully applied in Italy by himself, and exhibited cases of facial plastic surgery, presenting his original studies on the "Gradual Autonomic Tendencies of Flaps in Reconstructive Surgery." Besides his scientific achievements, Professor Ceci has turned out some excellent and distinguished pupils who occupy prominent positions in various hospitals in Italy.

The Institute of Surgical Pathology is directed by Professor Ferrarini, a pupil of Iginio Tansini of Pavia, author of many important experimental studies which give promise of a successful career.

Forty miles from Pisa, in one of the prettiest places in Tuscany, the so-called Valley of the "Nievole," is

Monte Catini. It is called the Italian Carlsbad, and is the most noted saline springs in Italy. Monte Catini is the most attractive health resort in all Tuscany, especially in spring and autumn; and the facility of communication makes it easy and convenient to reach the place from Florence, Pisa and Lucca, in fact, from Rome and Genoa, since it is only a few hours by rail from each city.

The fertile surrounding country and the nearby Apennines provide excursions full of interest, and the numerous and sumptuous hotels and the magnificent villas scattered all over, make it the favorite resort of the aristocracy of title and wealth. Charitable public institutions amply supply the means of relieving also the poor, suffering from the ailments for which the springs are recommended—principally intestinal, stomach, and liver diseases.

Less than three miles distant, is a wonderful natural grotto called "Monsummano," renowned all over the world for its efficacy in rheumatism, being a natural steam bath of medicinal properties.

Chapter XX

THE UNIVERSITY OF SIENA

AFTER reading the history of Siena, one cannot visit that noble city without the highest sense of reverence and admiration. On April 21, 1555, the Spanish troops, commanded by the Marquis of Marignano, entered the gates of Siena after a year of siege, during which the town was reduced to extremities, and was forced to capitulate to the overwhelming army of Emperor Charles v. It was a year of fighting and starvation, indescribable and unsurpassed in history. Only after the Sienese had lost most of their men able to bear arms and their women too, who had worked and fought in ditch and on rampart; after they had ejected the aged and infirm and all their children from their gates, to die upon the bayonets of the enemy; after they had eaten the last blade of grass within the walls—only then the city surrendered. Of the 40,000 citizens, only 6,000, specters of humanity, dragged their emaciated bodies across the barren hills to Montalcino, where those glorious survivors maintained a shadowy form of a republic for a few years.

Siena was annihilated, after centuries of glorious achievement in science, art, industry, under a liberal Government; it did not rise again until another liberal Government, three hundred and four years after that glorious fall, annexed the city to the new Italy, April 30, 1859. Since then the University of Siena has made rapid and wonderful progress.

The surgical clinic of Siena owes most of its present reputation to Prof. Domenico Biondi, whose untimely death, only a few years ago, deprived the University of Siena of one of the most distinguished members of the medical school.

Professor Biondi, originally a pupil of Carlo Gallozzi and Antonino D'Antona, both, successively, professor of the surgical clinic of Naples, completed his studies in the clinics of Vienna, Leipzig, Halle, Berlin and St. Petersburg, and taught histology at the Physiological Institute of Breslau, where he made special studies and published original works on the blood and on the thyroid gland. He returned to Italy, called there to direct the surgical clinic of Cagliari, where he remained eight years, being promoted to Siena in 1899, where he died (1915). His scientific productions are both varied and important, and as it would take too long to review all of them, mention will be made here only of the most notable. In 1882, he published a work on the experimental resection and total extirpation of the lung; in 1885–87, he published a complete study, review, and development of spermatozoöns and spermatogenesis, studied by means of the comparative histology of the testicle, in different degrees of formation, in rats, bulls, dogs, rabbits, pigs, monkeys, antelopes and frogs. This study showed that in the canaliculus (spermatic) there is only one variety of epithelial cell, the seminal, from which nucleus the spermatozoön is derived.

Biondi's researches on the streptococcus, on pus, and on blood, especially the last, are very important. Well known is the method of staining which goes by his name, a reactive made of acid fuchsin, orange and methyl green.

Among Biondi's works on embryology there are some

on the congenital fissure of the lips and cheeks, and on the embryological formation of the face, which are recorded in every textbook. He was also the first to determine the exact function of the thyroid gland (1891).

In his publications on pathology and clinical surgery, which number more than seventy, Biondi touches upon almost every subject in surgery. Among these, especially worthy of note, are: "Contributions to the Surgery of the Lungs" (1895); "Experimental Intrathoracic Esophagogastrostomy" (1895); "Clinical Contributions to the Surgery of the Pancreas" (1897), accompanied by the history of a case of extirpation of the head of the pancreas for benignant tumor, successfully cured; also a contribution to endo-oral plastic surgery (by a special method); special method of fixation of the movable kidney with a gauze-band around the organ placed in normal position; clinical notes on 8 cases of operation on the spinal cord (1900); notes on purulent peritonitis (1902); statistics, with discussion of 464 cases of appendicitis (1904–1912); contribution to the cure of echinococcus of the liver (1905) by a special method, consisting of laparotomy, partial evacuation of the cyst with a capillary trocar, and injection of 20 c.c. of 1:1,000 solution of silver fluoride, with occlusion of the puncture and of the abdomen (a treatment used successfully in 20 cases). He also published articles on the treatment of the tuberculous spermatic duct with injections into the deferent duct (1908); gastric surgery, with 54 cases of posterior vertical gastro-enterostomy, 9 cases of pyloric occlusion by a special method, 11 cases of total gastrectomies and 10 cases of total cholecystectomy.

Biondi's fine and efficient method of teaching produced some very able pupils who do honor to their master, and during his period of tuition more than two hundred important surgical pamphlets were published by several of his students.

Biondi's worthy successor is at present Prof. Vittorio Remedi, a pupil of Professor Novaro, who follows in the footsteps of his celebrated master. His publications are not as yet numerous, but very important: "Congenital Papilloma of the Tongue" (1891); "Hematolymphangioma" (1897); a very good work on hernia, especially of the inguinal oblique, which, in a great majority of cases, according to his experience, is congenital (1893). Later he described particularly the different proceedings of Bassini's method, suggesting some personal modifications (1904). He has to his credit some notable contributions on the surgery of the biliary canals and on that of the pancreas, dwelling extensively on 2 cases of suppurative pancreatitis. An interesting study is his article on the histology of the mucous membrane in exstrophy of the bladder, in which he describes the alteration of the vesical epithelium, and the neoformation of the glands, in a particular case.

But especially worthy of consideration are Remedi's experiments on the antitoxic influence of the thyroid gland on tetanic poison, experiments which prove that the poison of tetanus loses its toxic power in the thyroid.

The Institute of Surgical Pathology is directed by a young but able pathologist, Prof. Domenico Taddei, a pupil of a most distinguished teacher, Prof. Enrico Burci of Florence.

Professor Taddei's success corresponds to the splendid scientific preparation he had under Prof. Burci, and his scientific productions show already the advantages he gained from his clinical and laboratory education. Here follows a list of his publications: "Hemoangiosarcoma Endothelialis of the Tonsils" (1900); "Angioma of the Breast" (1904); "Renal Hematuria" (1907); "Fracture of the Epistropheus Without Medullary Symptoms" (1912); "Supercecal Stenosis and Movable Kidney" (1914); "Contribution to the Study of Spina Bifida" (1906); "Contribution to the Pathogenesis of Cystic Kidney" (1908); "Pathology and Clinical Course of Kidney Tumors" (1908); "Contribution to the Study of the Plexiform Neuroma" (1913); "Contribution to the Study of Subcutaneous Lesions of Some Viscera—Spleen, Choledochus, and Small Intestine" (1914).

In a publication (1901), repeated in 1917, Taddei favors the lateral partial ligature of the veins with silk, without compromising their functions, presenting a few clinical cases of the kind. He also brings out the results of the use of Burci's method in the resection of the liver, a proceeding applied with success in a case of splenectomy with adherent spleen in a malaria subject (1901–1915). Other publications are his researches on the histological modification of the ureter after nephrectomy (1914), the genesis of elastic fibers in cicatrices (1903–1905), the effect of large adhesions of the omentum on a decapsulated kidney (1907), the grafting of the suprarenal capsule on the kidney (1907); the result of ligating the artery and vein emulgent in kidneys previously decapsulated and covered with omentum

(1908); the total extirpation of the mucous membrane of the bladder (1912), etc. His essay on wounds produced by modern guns attracted the attention of military surgeons.

Taddei is now editing a treatise on semeiotic surgery, which, from the chapters already published, promises to be an excellent work.

Notwithstanding the political vicissitudes and struggles which in many centuries kept Siena oscillating between the extremes of power and submission, and, from a prosperous city of more than 100,000 inhabitants, reduced it to a small town of a little more than 20,000 (the population of today), yet the immense treasures of art are still there, almost intact, and claim for Siena the title of "The Jewel of Tuscany.'

Every palace is a monument and a model for study, every hospital has some work of art attached to it. Most of the buildings carry with the name of a celebrated artist, some historical remembrance. There is no place in Tuscany, and perhaps in all Italy, so fascinating, so attractive, so hospitable; no place so full of tourists in search of mental relaxation, useful education and pleasant physical rest.

Chapter XXI

THE INSTITUTES OF FLORENCE

THAT Florence should be called the garden of Italy, is not suprising, for Tuscany, of which Florence is the capital, is one of the most favored regions of Italy.

The climate is temperate and the rainfall not excessive; the Apennines shelter it from the cold north winds and the prevailing winds of the west. The fertility of its soil is famous and its mineral resources are well known, as also are its industries, which have greatly developed of late.

Since the union with Italy in 1859, Tuscany has ceased to constitute a separate political entity, although the people still preserve definite regional characteristics. The territory has increased in wealth and education, and owing to a good system of land tenure, the peasantry is among the most prosperous in Italy.

What is said of Tuscany, can be repeated of Florence, with the addition of almost a thousand years of civilization, so that notwithstanding its many conflicts, its ups and downs of power, the city has always been considered the center of art, science and culture, and is today still recognized as such by the whole world.

Dante, Michelangelo, Giotto, Fra Angelico, Benozzo Gozzoli and an almost endless chain of familiar names, with the beautiful monuments and collections of art and scientific documents, are in the minds, before the eyes and in the hearts of millions of people. And millions

more in the future will go to Florence to visit, to see, to study, to learn amidst such an enormous wealth of treasures.

But of the Florence of today, of the glorious revival of science, of art, of industry, which has given such a splendid example to the rest of Italy, and to the world, since its annexation to the new kingdom of Italy in 1859, no mention is made in the many books written to glorify a past, which is beautiful, great and precious, but is not the life of today, the hope of tomorrow, the pride of the future.

Florence today is a center for the study of philosophy and philology; of physics and natural sciences; of medicine and surgery. It has an institute of social sciences; one of fine arts; one of astronomy; one of geography; one of public hygiene; one of anthropology; and many others, all of which are well supplied with competent instructors and frequented by numerous classes of students.

The Institute of Medicine and Surgery is flourishing and is directed by some of the best teachers of Italy, notable among whom are Giulio Chiarugi, professor of anatomy; Alessandro Lustig, professor of general pathology; Guido Banti, professor of pathologic anatomy, and Enrico Burci, professor of clinical and operative surgery.

The surgical clinic of the Institute has had a very enviable reputation, first with Giuseppe Corradi, who, after a score of years of a brilliant career, and notable publications on several subjects, especially in urology, left the chair to Francesco Colzi in 1894. He made a large contribution to scientific surgery, including an

original description on cholecystenterostomy, erroneously bearing the name of "Winiwarter's Operation."

An unfortunate accident cut short the life of this promising surgeon and teacher, but his place was well filled by a young man, Prof. Enrico Burci.

The work of Burci deserves consideration, for his practical surgical work is always conducive to the scientific study of pathology.

His studies on the suture of the arteries, on the traumatic lesions of the arterial layer and the possibility of denuding an extensive tract of a large arterial vessel without serious consequences, on the grafting of veins with suture, on a particular technique for operations on the intestines, on a special enterostomy for enterostasis of the intestine, on experimental researches for extraperitoneal splenopexy, on decapsulation of the kidney, on resection of the liver for echinococcus, on suppurative nephritis, and on the application of elastic ligature in partial resection of the liver are well known in Italy, and have also been reproduced in foreign medical journals.

Professor Burci distinguished himself during the war for the efficiency with which he conducted the work of supervision of convalescents, a delicate and highly responsible position which gained for him recognition and praise.

The Institute of Surgical Pathology is directed by Prof. Gerolamo Gatti, who also has charge of the Surgical Pediatric Clinic. He is the author of several publications on pathology; one of these (1896), reprinted in the *Langenbeck Archives*, deals with the healing process of peritoneal tuberculosis, with a histo-

logical study of the subject; another discusses cutaneous sarcomatosis and double decapsulation of the kidneys in chronic nephritis; another, the new method of funiculo-abdominal hysteropexy. He has contributed many articles on surgery in children, including a monograph on umbilical hernia in infancy (1914), with statistics of 1,349 cases observed in thirteen years, in the Pediatric Clinic, in children under ten years of age.

Special mention must be made here of Dr. Theodoro Stori, who is considered the leading surgeon of Tuscany, as his very large practice and the high esteem he enjoys among his colleagues amply proves.

Florence has several surgical sections in the various hospitals, where the latest equipment and appliances are always found. One of these deserves special mention, being directed by Prof. Nicola Giannettasio, who distinguished himself during the war as director of a surgical section at the front, where splendid results were obtained by his own technique in operations and wound dressing.

Florence has also a Medical Military School founded in 1882, which is a kind of post-graduate school to prepare physicians for the army; this institution is like a military university, where the students are taught war traumatology, legal military medicine, military service and hygiene, microbiology, epidemiology, chemistry applied to hygiene, stomatology, and other laboratory courses for extending their knowledge.

Chapter XXII

THE UNIVERSITY OF NAPLES

THE University of Naples was founded in the twelfth century by Frederick II, but its school of medicine did not rise to great importance, perhaps on account of the School of Salerno which was known as early as the ninth century, and as "Civita Hippocratica" held a prominent position in medieval times, being considered the great seat of learning in Italy.

The School of Salerno was elevated to the dignity of a university in 1150 and was closed in the beginning of last century, in the year 1817. As Salerno is only about thirty-four miles from Naples, its ancient reputation attracted the bulk of the students, leaving the medical school of Naples rather neglected. The political struggles which upset the internal conditions of the big city, also kept Naples from developing its scientific institutions properly. But Naples of today, the largest city of the new Italy, with its 650,000 inhabitants, surprises the visitor by its great progress made since 1861, after the Southern States, thanks to the wonderful and rapid conquest of Garibaldi, were annexed to the kingdom of Italy.

A wise and prompt reorganization placed the University of Naples as the center of learning of a population of almost fourteen millions of people—the entire southern part of Italy. The university, a structure dating back to 1605, reconstructed in 1780, is an imposing building,

to which lately has been added some modern laboratories, equipped with all the modern improvements that science could suggest, including new anatomic and pathologic institutes and clinics.

The university is attended at present by more than 5,000 students and has a library of 400,000 volumes.

The courtyard contains a few busts (including a fine one of the great poet Giacomo Leopardi) and the statues of Pier della Vigna, secretary to Frederick II (one of the legislators of his time), of Thomas Aquinas, the Neapolitan philosopher of the twelfth century, the learned Dominican monk of Monte Cassino, whose works were published at the expense of Pope Leo XIII in 1903, and of Giovanni Battista Vico, the Italian jurist of the sixteenth century. Among the remarkable books which Vico published, two stand as texts of the highest intellect: "De Antiquissima Italorum Sapientia" (1710) and "De Universi Juris Uno Principio et Fine Uno" (1720). The courtyard also contains the statue of Giordano Bruno, the Italian philosopher of the Renaissance, who among his many metaphysical works in 1584 published "Cena Delle Ceneri" (Ash Wednesday Conversations) devoted to an exposition of the Copernican theory.

An extensive new university building has been constructed in the Corso Umberto Primo.

The University of Naples, on account of the large concourse of students, has a larger staff than any other university of Italy. The medicochirurgical faculty counts among its professors and assistants some of the ablest surgeons and docents in surgical tuition that could be secured.

The modern reputation of the surgical school of Naples is due especially to the lamented Prof. Carlo Gallozzi, who left many scientific publications, including an important treatise on operative surgery—a textbook for students and practitioners of the middle of the last century.

After a long period of teaching, Professor Gallozzi was succeeded by Prof. Antonino D'Antona, who died in 1913, leaving a large contribution to the scientific literature on surgery, and the well-deserved reputation of one of the most skillful and successful surgeons of modern Italy. He was a pupil of Gallozzi, also of Virchow, von Langenbeck, Spencer-Wells and Billroth, and he used his ability and wide experience in trying to free surgery from that empiricism which was still prevalent in the middle of the last century, particularly in the south. Being essentially a student of pathology, he always applied it to practical surgery, and in all his numerous publications he always united his surgical studies with his knowledge of pathology, as illustrated in "Surgical Pathology of the Blood-Vessels," "Physiopathology of Contracture," "Ulcerative Inflammatory Processes," "Common Acute Surgical Infections," and two big volumes on the surgery of the central nervous system. At the end of his useful career he published some original treatises on surgical tuberculosis, especially in reference to abdominal tuberculosis. He provided the clinic with a very modern laboratory and a rich library of useful books and magazines.

Professor D'Antona was considered one of the best operators and one of the best instructors of his time, his many pupils attesting to his worth as a teacher. Among

these is the present incumbent, Prof. Giovanni Pascale, who has followed intelligently the noble traditions of his teacher with some interesting publications on experiments in bone graft, conservative surgery in tumors of the scapula (1904), primitive myxofibroma of the vermiform appendix, surgical intervention in traumatic facial paralysis, spinofacial anastomosis for the first time successfully done in Italy (1906), treatment of aneurysm with removal of the sac, operative technique in prostatic hypertrophy, operation by cutting the inferior calcaneoscaphoid ligament in place of Phelps' operation, and decortication of the lung for chronic empyema.

To form a correct conception of the conspicuous work done at the surgical clinic of the University of Naples, one has to read the large and complete report made by Professor Pascale's predecessor and teacher, Prof. Antonino D'Antona, "Rendiconto Scientifico Clinico del Quinquennio (1905–1909)," in which are documented all the marvellous activities of the school during that period.

Some of the other pupils of Professor D'Antona, who are distinguishing themselves in their work and by means of publications, are the free docents—Rocco Camminiti, who has published a treatise on prostatic hypertrophy and sacro-iliac resection; Luigi de Gaetano on hepatic wounds; and Filiberto Jacobelli and Leopoldo Rizzo on other original subjects.

Mention must be made here of Prof. Angelo Roth, who, for a short time before his premature death, held the chair of special surgical pathology in which he distinguished himself. He had previously held the

chair of surgical pathology in Sassari, in his native island of Sardinia.

Independent of the Clinic, there is also the "Istituto di Medicina Operatoria," under Prof. Fabrizio Padula, who has made some useful studies upon cranial surgery, and the surgical anatomy of the limbs.

Naples has many large hospitals, where some very able surgeons, following the school of Gallozzi, D'Antona and Pascale, and some from the other universities of Italy, favored beside by the advantage of observations in other clinics at home and in foreign country, apply their knowledge and ability with success and honor.

The foreign visitor is so accustomed to consider Naples as the old nest of "Lazzaroni," mandolin players and street singers, the gay "City of Eternal Idlers," that it is difficult to convince him that there is a modern intellectual city full of thinking, studious, ambitious people, eager to learn, anxious to improve, to advance and to achieve in life's higher ideals. Yet Naples has today one of the largest universities of Italy, with more than 5,000 students, most of them from the southern regions, all following the regular course of each faculty, under the same rigid regulations which are the standard of all the Italian universities.

The contribution that Naples has made to the unification of Italy in the way of men of high standing in science, in literature, in art, in politics, and in every branch of the professions, is larger than from any other part of the country. There are, at present, at the head of the Government two men who came from the University of Naples, which has given to the country so many prominent patriots and leaders. These two men,

Benedetto Croce, the great philosopher, and Arturo Labriola, the well-known revolutionary socialist and political leader, represent in their writings the highest principles of social agitation. Recently there has been before the public in Europe, Francesco Nitti, the Prime Minister, who also, as a professor at the University of Naples, has published some elaborate works on finance and political economy.

Modern Naples also boasts an industrial growth which during the last twenty years has been marvellous, and is rapidly expanding. It manufactures marine engines; its trade in hemp, grown in the surrounding country, is very active, while liberal inducements offered by the Government have given a strong impetus to all sorts of business enterprises, so that there are now more than one hundred industrial establishments at work, including cotton and jute mills, tanneries and chemical works. Electric power is brought from famous River Lete, fifty miles distant; also from Popoli, with an 85,000-volt current (the highest in Europe).

The iron industry stationed at Bagnoli (Ilva Works) smelts 200,000 tons per year; another at Torre-Annunziata smelts half that amount, deriving ore from Elba. The big industrial house of Armstrong has a large ship-building establishment at Pozzuoli, and a similar one exists at Torre-Annunziata. It is impossible to enumerate the thousands of enterprises of such an active population, a condition which promises a future of prosperity never before known.

The surroundings of Naples are beautiful and the excursions to Sorrento, to the little island of Capri, along the coast of the Gulf of Salerno, to Amalfi, Ravello,

Pestum, are so well known that a further description is unnecessary.

Of the many health resorts near Naples, the most popular are, first: that of Castellamare di Stabia (*Fontes Stabioe*, celebrated by Pliny—*in agro Stabiano aqua quae vocatur dimidia, calculosis medetur*, and by Columella—*fontibus Stabioe celebres*), which are very highly recommended for glandular diseases, for intestinal torpidity, in kidney troubles and skin affections. Castellamare is a beautiful city on the gulf, only twenty miles from Naples, one-half hour by rail or car. The second is the famous island of Ischia, only twenty miles by steamer from Naples. Exposed to the northerly winds in winter, it is a cool summer resort. Near the little town of Ischia, is Casamicciola, the most picturesque village, in which the most famous hot baths on earth are located. Both places have splendid accommodations for rich and poor, and the efficacy of the waters has been well advertised all over the world.

The volcanic surroundings and the condition of the country around Vesuvius explain the abundance of health resorts adjacent to Naples. In fact, besides the famous baths of Casamicciola, recommended for all sorts of bone affections, chronic rheumatism and skin trouble, there are, almost in Naples itself, the renowned baths of Chiatamone and those of Pozzuoli, also well provided with all sorts of modern equipment for the comfort of the patients who throng there in great numbers the year around on account of the mild climate and the natural beauty of the country.

Chapter XXIII

THE UNIVERSITIES OF SICILY

OF the many hundred books on Sicily, written in almost every language, only two are really true to the actual character of the people, the peculiarity of the masses, the condition of the country, the aspect of the land. Yet those two books are almost unknown and perhaps long forgotten by some who happened to read them.

One was written many years ago by the great social writer of Sweden, Selma Lagerlöf, in the form of a novel,[1] in which the philosophy of a noble soul is revealed—the awakening of a new generation, after centuries of profound sleep, is vividly described. The other was written by the candid mind of Edmondo De Amicis, only a few years before his death. One is a marvellous description of that feudalism, which has been the curse of all the southern countries of Europe: a feudalism supported by the profound ignorance of the people, debased by all sorts of superstitions and human degradations. The unification of Italy, the liberation of Sicily from the despotism of the Bourbons, which Gladstone described as "The Negation of God Erected into the Form of a Government," awoke the dormant spirit of an intelligent and bright race, crushed for centuries by the most brutal servitude.

Not until 1860 did Garibaldi break the yoke of their

[1]Miracles of the Anti-Christ. English trans. by P. B. Flach. New York, 1909.

bondage, and then, for the first time in many centuries, the Sicilians were free to work out their social and political salvation.

Selma Lagerlöf describes in her novel, the crucial time of that awakening, the struggles and the battles between the dense fog of ignorance and the light of liberty, trying, by means of its apostles, to find its way through. The battle is still going on today, and will perhaps last a few generations more, until, at least, the last sign of feudalism is eradicated entirely, and broader education has relieved and uplifted the whole country.

The tears of Edmondo De Amicis on the tardy progress of Sicily have an echo in the lamentations of the late negro educator, Booker T. Washington, who, in his love for his race, deprecates with bitterness the slowness of the American people in educating the South, and in the work of V. Blasco Ibanez, who looks upon his countrymen with contempt because of their antiquated customs and ideas. Russia of today could give some ideas on the cost of rapid evolution in a country.

The Great War, which has caused an unparalled hurricane throughout a world of civilization, of education, of refinement of long standing such as Europe was supposed to be, centered exactly where the highest standard of human progress had been cultivated to perfection. But, what was called brigandage in Sicily, in Spain, nay, in the Balkans and in Morocco, was almost a chivalrous, passionate vendetta, compared with the assassinations of thousands of youths by deadly gas, of innocent children by submarines; the torture, rape, and unmerciful hanging and shooting by an undisciplined military mob, maddened by suffering and

the beastly instincts of nature perverted by wrong influences and teachings.

During those five years of unbridled violence, humanity committed more crimes and brutalities than were committed in the past centuries by the Sicilians, Spaniards, and by the negroes of the South. But human hypocrisy will call the first, an heroic epoch to be written in the history of the world, so that, in future wars, people may study and learn of the great deeds of the glory of the past. Meanwhile, the robbery and the misery which disgraced humanity during those same five years will be carefully avoided or entirely ignored.

If the billions, which have been wasted in finding the best way of killing men and destroying what was the world's pride and joy, had been spent in educating the South, in improving Spain (according to Ibanez), and in giving to Sicily roads and division of the land, and to the Balkans a whiff of that so much praised human education, progress and civilization—perhaps the world would be much better off today.

Sicily has been neglected, as many other worthy countries have been before, and are still neglected, because of the unfortunate force of circumstances. Nature's fatalities, and sometimes cruel, hard destiny, turn a flourishing empire to ruin, a city to ashes, and a country to devastation. But man remains, the race thrives, traditions cultivate the spirit of nationality, the spark of a new life rekindles the fire of a new era, history writes once more the deeds of a new nation. It is the world over and over again, as before.

We all know that Sicily has been the field of many struggles of race against race, nation against nation,

and creed against creed. Sicily has been the prey of Phoenicians, Semites, Aryans, Greeks, Carthaginians, Romans, Pagans, Christians and Moslems, who made it the field of their contests, of battles and of successive domination and glory. Later the Saracens, the Normans, the Angevins struggled with each other for the sake of ruling the beautiful country. They left it at last dilapidated, exhausted, forgotten in the hands of a corrupt Government, abandoned to all sorts of superstitions, lawlessness and misery, until Garibaldi, in 1860, gave to the island its freedom.

The use that Sicilians have made of that freedom has been constant but slow, on account of the feudal system of land ownership which cannot be changed rapidly without dangerously upsetting the social method of life in a community. When Garibaldi wrested the island from the yoke of the Bourbons, not one single mile of railroad had been built. The island was infested by brigands and 90 per cent of the people could not read or write. Today all the principal points are connected by a railway system similar to that of the south of Italy, with the exception of the branch line to Corleone and around Mount Aetna. Illiteracy has been reduced to 25 per cent, which is more than remarkable when the peculiar condition of the country, the character of the people, the political and social circumstances are taken into account.

The socialistic ideas, which were introduced despite the bitter opposition of the capitalist, landowners and bigoted clergy, made rapid headway, thanks especially to a strong-minded and courageous patriot, Giuseppe de Felice-Giuffrida. His native city, Catania, honored the

anniversary of his death in July, 1920, and the parliament of Rome, where he represented his "College" for so many years, devoted a special meeting to eulogizing his life, his work and his intelligence, bestowed entirely upon his country and his ideals. Catania, which was the constant object of his socialistic reforms, is today a beautiful modern city of 150,000 inhabitants, perhaps one of the most progressive cities of Italy, and certainly the most advanced in every modern improvement in industry, trade and commerce. Well favored by a good seaport, it ranks second, after Genoa, in activity and importance.

The splendid contribution of the Sicilians to the war will remain in the history of Italy as one of the brilliant episodes, indicative of the unification of the Italian people from the Alps to the extreme southern point of the island, Capo Passero, which is the best guarantee of the national solidity of the new country.

PALERMO

Palermo did not, like Catania, nurse in its bosom a De Felice Giuffrida. The capital of Sicily with its 250,000 inhabitants has changed but little, for, like a coquettish, beautiful woman quite satisfied with her beauty, the town did not think it necessary to add anything to enhance its attractiveness. Nature has been so generous in its favors that Palermo will always be a fascinating place, without any touch of up-to-date civilization: the famous cathedral, the famous theater, the famous Villa Reale, the famous Monte Pellegrino are quite enough to satisfy the pride of any city in the world. Besides, it has its glorious past history, and the

still more glorious history of modern Italy, which is, perhaps, the most glorious of all.

On May 27, 1860, the red-shirted immortals, "The One Thousand of Garibaldi," captured the city. When the citizens, frantic with joy, rushed to the belfry to sound the tocsin, they found that the Bourbon police had removed the clappers, but undaunted, the infuriated crowd, with hammers, terrified the mercenary soldiers of the Bourbons. Eight hundred red-shirted volunteers of Garibaldi, followed by a horde of 4,000 youths of Sicily, poorly armed, wrested the city from 20,000 regular soldiers, well armed and fortified in the most strategic points of the city. Palermo was free, and from that day, the whole kingdom of the Bourbons was doomed.

All this and the enchantment of the perfect climate, the luxurious tropical vegetation which made the "Golfo degli Aranci" and "La Conca d'Oro" a famous attraction for tourists, for health seekers and pleasure lovers, did not seem to be inducive to meditation and study. Yet the city is today the possessor of a very important atheneum, is the center of an advanced educational system not inferior to the best university of Italy, a remarkable fact considering its recent foundation.

The opposition of the two old Universities of Catania and Messina frustrated the effort of the citizens of Palermo in obtaining a Government grant and support to a university. So it was only in 1771 that a Royal Academy was inaugurated, and, in 1805, a university granted, which began to rise in importance until 1860, the year of the annexation of Sicily to the new king-

dom of Italy. Palermo's university has today a matriculation of about 1,500 students in its five faculties, and its surgical clinic has achieved more than a national reputation.

The surgical clinic, previously directed by Iginio Tansini, at present professor at the University of Pavia, is ably directed by Prof. Ernesto Tricomi, a pupil of Professor D'Antona of Naples. Professor Tricomi, apart from his reputation as a learned pathologist, is considered an able and brilliant operator, especially in abdominal surgery. His "Contributions to Gastro-Entero-Anastomosis" (1899); a total extirpation of the stomach accomplished in the same year following a special method of gastrostenoplastic in cases of idiopathic gastrectasia (1895); his interesting experiments on hemostasis of the liver, with gauze packing and omentopexy, followed by a partial hepatectomy (1893), and a resection of the left lobe of the liver (1894); his rapid method of treatment of echinococcus cyst, with total extirpation of the echinococcus liver (2 cases in 1899); his surgery of the pancreas (1898); and important contributions covering statistics of seventeen operations for splenectomy: seven for malarial hypertrophy, five for ectopy, three for simple hypertrophy, one for leukemic hypertrophy, and one for an echinococcus cyst (1898)—all are emphatically worthy of special mention.

Tricomi also described a new method for the treatment of crural hernia, consisting in the use of one stitch, U-form, which should include the inguinal ligament of Cooper, the sheaths of the vessels, the pectineal and Gimbernat's ligaments (1891); and in 1896 he proposed

a modification of nephropexy, while in the same year he published 3 cases of Basedow's disease, treated surgically with success.

At the University of Palermo, there is also an institute of operative medicine, independent of the surgical clinic, under Prof. Gaetano Parlavecchio, pupil of Professors D'Antona of Naples, and Durante of Rome. Parlavecchio, like Tricomi, has to his credit a large contribution to surgical literature, including abdominal cases. Among his original writings there is a publication, worthy of note as preceding by a great many years a similar one on the same subject in *Annals of Surgery*[1] ("Transthoracic Laparatomy")—"Contributo alla Chirurgia del Diaframma, Operazioni per Suture di Ferite Diaframmatiche coi Metodi di Postempski e Rydigier Modificati."[2]

Another is, "Le Nuove Conquiste della Chirurgia Renale"[3] in which Parlavecchio refers to a case of incision of the kidney to the papilla, decortication and packing with omentum, and ten days after, ligature of the vessels of the hilus, followed after eight days by extirpation of the other kidney (omental intraperirenal telangiostomosis). Several other publications, "On Rhinoplasty;" "Splenotomy;" "A Case of Wounds of the Heart Successfully Treated with Immediate Suture;" "A New Method in the Treatment of Crural Hernia," and many other valuable contributions place him among the leading surgeons of Italy.

Several young adjunct professors, especially devoted

[1] August, 1919, ixx, No. 2.
[2] *Riforma med.*, 1893, ii, 146.
[3] Tip. Brangi. Palermo, 1906.

to surgical pathology, attend to the instruction of the students, among them, Eugenio Arcoleo, Abele Ajello, Vincenzo Baviera, Clemente Calzavara, Salvatore Deliberti, Carlo Pantaleoni, Giuseppe Piazza and other rising surgeons.

CATANIA

The rise of the University of Palermo was naturally detrimental to that of Catania, the oldest university of the island. Founded in 1444 by Alfonso of Aragon—largely endowed, it reached a climax of prosperity, when, as the only atheneum of the island, it was frequented by more than 2,000 students.

The terrible earthquake of 1693 having destroyed the large palace, built in 1684, a new building was erected after many years and completed only in 1818, with many laboratories equipped with all modern requirements.

The surgical clinic was under Prof. Gesualdo Clementi, a surgeon and clinician of established reputation. Following the tendency of many modern surgeons, he devoted his time more to abdominal surgery than to any other branch, contributing by means of operations and statistics to the literature on the various abdominal affections. He was one of the pioneers in suggesting early surgical intervention in abdominal traumas, and at the Congress of Italian Surgery in 1891, he presented 65 cases of penetrating abdominal wounds successfully cured by early laparotomy. At the same Congress he also contributed an article on hemostasis in the resection of the liver with the immediate ligature of the injured vessels. He was considered one of the most daring and able modern surgeons in Italy.

Occupying the chair of special surgical pathology at present is Prof. Giuseppe Muscatello, a reputable pathologist, who published some interesting studies on spina bifida, following von Recklinghausen's classical work, giving a classification based on an anatomicopathologic conception recognized and accepted by every scientist. His studies on the lymphatics of the diaphragm are very original, as are also his contributions to the suture of the arteries and his experiments on empyema from staphylococcus.

Before coming to Catania, Muscatello was pathologist at the University of Pavia, where he had distinguished himself both as a clinician and an operator, publishing the history of a case of pneumonic abscess and another of the spleen; likewise a work on the radical cure of exstrophy of the bladder (1904), with a modification of the operation of Maydl (ureterotrigonosigmoidostomy); another on the tubercular multiple stenosis of the intestine of children, and the intestinal obstructions from ascarides (1905).

Special adjunct instructors at the University of Catania in special surgical pathology are: Michele Guzzardi, Annibale Costa, Vincenzo Tomaselli, Nunzio di Stefano, Giovanni Zurria, Umberto Benedetto; and at the surgical clinic: Gaetano Caponetto, Ottaviano Giuliano, Santi Rindone and Carmelo Ferlito.

MESSINA

Messina was reduced to a heap of ruins on December 28, 1908, by a fearful earthquake followed by a tidal wave. One hundred thousand people, of the 150,000 (which was the total population of the city at that time)

perished in the terrible catastrophe and the university was also destroyed, with great loss of life among the professors, and with the irreparable loss of all the scientific collections, libraries and documents. The surgical faculty lost Prof. Gaspare D'Urso, a pupil of Professor D'Antona, who was holding with honor the chair of clinical surgery and operative medicine. Professsor D'Urso, also an excellent pathologist, left a large collection of scientific publications, including a valuable volume on "Bone Diseases" (1893); a study on bilious exudation into the peritoneum, with demonstrations on its innocuity; experimental researches on the effect of anastomosis of the deferent and ureter; and articles on pyonephrosis, on the resistance of venous blood-vessels against the invasion of sarcoma, on primary endothelioma of the liver, ichthyosis of the uterus, tumor of the ovaries, malignant tumors of the bones—especially endothelioma, the last being an original, complete work on the subject. Of great merit also are his statistical publications on the work of the surgical clinic of Messina. Unfortunately, with him perished his distinguished assistant, Prof. Giuseppe Betagh, demonstrator of surgical pathology.

The school of medicine of Messina has been reorganized and was inaugurated again in 1918 with Prof. Stefano Puglisi Allegra at the surgical clinic and Angelo Isaia at the head of the department of special surgical pathology. They expect in time to rebuild the laboratories and the hospitals.

Chapter XXIV

THE UNIVERSITIES OF SARDINIA

THE island of Sardinia, the second in size of the Mediterranean islands, the first being Sicily, has an area of about 9,300 square miles, with a population of nearly 870,000 souls, while the State of Vermont, with an area of about 9,700 square miles, has a population of less than 360,000 inhabitants. But Vermont is in the United States, while Sardinia is a neglected island in the Mediterranean Sea, cut off from the continent by insufficient means of communication. This circumstance unfortunately has retarded the development of the agricultural and mineral resources that could bring wealth and comfort to the people, otherwise naturally intelligent and intensely laborious.

As it is, on account of the difficulty of communication, the cities of the coast are the principal centers of population. Cagliari at the extreme southeast, with over 50,000 inhabitants, and Sassari at the extreme northwest with about 35,000 inhabitants are the most important. Both are provided with universities. The first was founded in 1626, the second in 1617; both now conform to the uniform standard of the other universities of the kingdom.

THE UNIVERSITY OF CAGLIARI

The surgical clinic of Cagliari is under the direction of Prof. Roberto Binaghi, pupil of the late Angelo Roth.

His experimental researches upon the pathogenesis of intestinal invagination (1902), epigastric hernia, and his clinical studies on pyelotomy for giant calculus of the little pelvis, with pyeloplastic and posterior permanent catheterism of the ureter, are well known works.

The institute of surgical pathology is under Prof. Gaetano Fichera, a pupil of Professor Durante of Rome. Professor Fichera devotes his time especially to the study of tumors, and has founded a review in which he collects all the scientific studies and publications upon tumors in Italy.

Professor Binaghi is well supported by able assistants in the persons of Francesco Potzu, Antonio de Cortes, and Angelo Garau; while general pathology is under the superintendence of Prof. Aldo Perroncito, son of the famous pathologist and bacteriologist of the University of Turin.

UNIVERSITY OF SASSARI

The University of Sassari had for many years a very able practical surgeon as the incumbent of the surgical chair in Prof. Angelo Roth, recently deceased.

Professor Roth left some valuable publications on prostatic gland surgery, and the *Folia Urologica* of Leipzig (1907) published his 315 observations on suprapubic cystotomy, an operation which he was the first to practice in the treatment of urethral fistula (1886–1889). Several years later, Pousson (1894) claimed priority for the use of this treatment which was original with Roth.

The chair of surgery after the death of Angelo Roth

was temporarly occupied by Giovanni Andrea Pietri in the departments of clinical surgery and surgical pathology, and by Vincenzo Dettori in operative medicine, having for his assistant, Prof. Vincenzo Giordano, who has published some valuable treatises on thoracic surgery.

Chapter XXV

FREE UNIVERSITIES

OF the three free universities, Perugia, Camerino and Ferrara, the only one which is complete is the first. Perugia, a small city of about 25,000 inhabitants, half-way between Florence and Rome, is well known to the world of artists and to pleasure seeking tourists for its position, its historical importance as the capital of beautiful Umbria, and for its precious collection of artistic treasures. Its situation is splendid and its accommodations in comfortable hotels and hospitable houses are unparalleled.

In a book published twenty years ago by Margaret Symonds and Lina Duff Gordon, a splendid description of the origin of the city, its vicissitudes and its present condition is given so accurately that any addition would be futile.

The university, five hundred years old, has been reorganized since 1886. Shortly after, a worthy pupil of the surgical school of the University of Turin, Professor De Paoli, was elected to the chair of clinical surgery and surgical pathology, and held it with great honor until 1913. During that long period, he published: "Researches on Tuberculosis of the Salivary Glands" (1894); "On Percussion of the Skull in Traumas and Endocranial Diseases" (1897); "Traumatic Detachment of the Epiphysis" (1903); "Researches on the Efficacy of Injection of Nucleinate of Soda to Prevent Operatory Peritoneal Infections" (1910); "Researches on Biliary

Calculus" (1921); "Contribution to the Histological Studies of Renal Angiosarcoma, of the Tumor of the Suprarenal Capsule." All these contributions are well known in the scientific world.

At present, several scholars from the school at Perugia direct the clinics of the important hospitals in several cities in Italy—Professor Santarnecchi of Umbertide, Professor Mattoli of Chieti, Professor Gianantoni of Fabriano, Professor Arcangeli of Cavarzere, Professor Rubegni of Gualdo-Sabino, and Professor Bracci of Terni.

Professor De Paoli after his retirement served with distinction during the war as colonel in the Reserve Corps.

The present director of the surgical clinic of Perugia is Prof. Carlo Righetti, pupil of Professor Burci of Florence. He has to his credit some very important publications on cranial surgery, on the pathogenesis of hemorrhages in hydronephrosis, and on the lesions of the thoracic duct in the neck. Professor Righetti served with distinction during the war.

At the University of Camerino, Prof. Giovanni Razzaboni, an able pathologist, is director of the surgical clinic, where he has already published some valuable works on suppurative phlogosis of the lung and pleura; on the slow healing of thoracic empyema after resection of the ribs; on the evolution of lymphatic glands in fractures; on sarcoids and their blastomycetic origin; and on craniocerebral topography.

The University of Ferrara lacks at present the complete course, and there is no incumbent in the surgical department.

Chapter XXVI

SURGICAL LITERATURE

THE medical press in Italy is well represented and may be considered equal to the scientific progress of the time.

The most important review is *La Clinica chirurgica*, founded in 1893 by Professors Bottini and Tansini, originally directed by Professor Ceccherelli of Parma, and at present by Prof. Roberto Alessandri of Rome. It contains, in every issue, many original articles and a special section, called "Subjects of the Day," in which the director mentions, illustrates and discusses the most vital surgical questions treated by the domestic or foreign press. This is followed by a synthetic review of some pathological or clinical thesis and a bibliographic summary, with brief comments on all the home and foreign publications on surgery, besides the usual criticism of all the publications on surgery by the medical academies of Italy. It is a monthly review which contains the greater part of the history of Italian surgery, and during the war was the echo of all the work and writings upon war surgery worth mentioning.

The *Policlinico* is a periodical founded by Professors Baccelli and Durante in 1894, which deals, in three separate parts, with medicine, surgery and everyday practice, with original articles by members of the Italian Medical Society and some from practicing surgeons.

The other reviews are: *La Riforma medica; Gazzetta degli ospedali e delle cliniche; Gazzetta Internazionale*

di medicina, chirurgia e igiene; La Riforma veneta di scienze mediche; Lo Sperimentale (a journal of medical sciences, founded by Bufalini in 1848), actually the organ of the Academy of Medicine of Florence; *Il Morgagni* (founded in Naples by Tommasi) divided in three parts—an archive of original collections, a bulletin of clinical data and a review. *Pensiero medico* and *Rivista ospedaliera* of Rome, have also important notes on surgery.

Although not exactly in the actual line of surgery, mention must be made of the *Archivio di ostetricia e ginecologia, La Rassegna d'ostetricia e ginecologia, Annali di ostetricia e ginecologia, La Ginecologia,* and *Folia ginecologica.*

Every university has its academy of medicine with the usual bulletin or newspaper, containing sometimes extremely important communications; as, for instance, the academies of Turin, Rome, Bologna, Genoa, etc. Naval and military surgery has two reviews which have been very important during the war.

The Italian Surgical Society is an old and solid institution, which holds congresses every year, discussing important subjects relating to clinical surgery and pathology. Last year the congress convened in Trieste.

It was mentioned in the chapter on Cagliari that Professor Fichera, director of the surgical clinic, publishes a review on tumors in which he gathers all contributions, laboratory and clinical observations which illustrate the pathogenesis and the pathological anatomy of malignant blastomata, and the most modern treatment.

Among the periodicals of general character is the *Archivio per le scienze mediche*, founded by the lamented Professor Bizzozzero, which continues its publications on anatomy, physiology, pathological anatomy and clinical data under Profs. Romeo Fusari and Benedetto Morpurgo of the University of Turin.

Italy does not lack in valuable treatises, among which well worthy of note are those by: Luigi Luciani on physiology; Guglielmo Romiti, Giulio Chiarugi and Romeo Fusari, each with a book on descriptive human anatomy; Alessandro Lustig and Gino Galeotti, each with a publication on general pathology; Guido Banti, on pathologic anatomy; Francesco Durante, on clinical surgery and pathology, with another on operative medicine; Domenico Taddei on surgical symptomatology; Davide Giordano, on operative medicine, and many other treatises on different subjects relating to surgery, pathology and operative medicine. Many serve as textbooks for schools and some have been translated.

Unfortunately, most of the treatises of the past have been hidden away in scattered localities, remaining confined to the small center of a university, known only to the limited number of students or practitioners of that special region. For instance, the writer of these pages, many years ago, while in London attending the clinic of Sir Henry Thompson, admired his rapid dilatation of urethral strictures. He was told with a complimentary smile, that the method was that of Antonino Toscano of Catania. On inquiry, he found out, not without difficulty, that Toscano had written a treatise on the subject, which was almost unknown in his own country.

Few indeed are familiar with the notable writings of G. Fiorani, on amputations with elastic ligature, and few would have known the long and accurate experiments of Giuliano Vanghetti, the modest but great practitioner of the little town of Empoli, if Professor Ceci, first, and others following him, had not applied his original discovery to practical use.

Scientific Italy is waking up to the realization that its work cannot always be stolen with impunity for the benefit of other nations, and that it is important for her dignity that her standing among the nations working for modern progress in surgery should not be ignored.

It is to be hoped that the scholarships and the exchange professorships of universities, as well as the already planned translation of the most important works of science, will soon reveal what modern Italy is, and what scientific intellectual Italy can do.

Handbook of Italian Operative Surgery

By Prof. Davide Giordano, Head Surgeon

VENICE

Dr. Davide Giordano, chief of the Civic Hospital of Venice, published in 1911 a large volume entitled "Compendio di Chirurgia Operatoria Italiana" which might well be called the history of Italian surgery. The publication is a large and exhaustive compilation which gives to the reader a good idea of the enormous work done by Italians in the field of surgery. The book was reviewed by Prof. Giacomo Filippo Novaro, his old master and teacher, recently retired from the University

of Genoa, and published by "Unione Tipografico-Editrice Torinese."

It is divided into two parts: The generic section and the surgery of the different regions. The first part deals with Anesthesia; Hemostasis; Aneurysms; Ligatures; Preventive Hemostasis; Transfusion; Endovenous Injections; Medication; Sutures; Organotherapy; Examples of Dressing in Special Infections; Tetanus; Carbuncle; Actinomycosis; Erysipelas; Tuberculosis; Lupus.

In the section on the surgery of the different regions Giordano embraces the whole system from head to foot, patiently gathering all the work done by Italian surgeons in the past and the excellent work done recently, pointing out the many original discoveries which have been shamelessly appropriated by unscrupulous foreigners.

In his history of cranial surgery he mentions Andrea della Croce, who described (1549) the armamentarium for the surgery of the head; Paolo Veronese, who wrote "De Vulnerum Capitis Curatione Libellus" (Venetiis, 1549); and Giovanni Passero Bergamasco (De Causis Mortis in Vulneribus Capitis . . . Et Recta Eorum Curatione . . . De Perforatione Et Abrasionibus in Cranii Lesionibus Non Satis Apparentibus, 1590), who then proposed trephining in cases of brain hemorrhage in which Fabricius ab Aquapendente insisted upon opening the dura. The same advice is given by Leone G. B. Carcano (a pupil of Falloppio) who well describes the symptoms of cranial contusions, deep hemorrhage without cranial lesions, accumulation of pus, in which he did not hesitate to intervene.

Giordano also mentions, in early cranial surgery, Cesare Magati, Pietro Marchetti and Marco Aurelio Severino, who set the rule of trephining in syphilitic cephalalgia, with the urgent opening of the skull in any case of epilepsy.

Opposed to such a heroic proceeding were Anselmo da Genova, in the twelfth century, and Nicolo' Cappelletti da Lucca in the eighteenth, although the operation was supported in Florence by Benevoli and Nannoni, in Milan by Molinelli, in Turin by Bertrandi.

Giovanni Battista Cortesi of Messina comments upon Berengario's trephining of the frontal sutures, and Rouhald of Turin upon the dura, which was practiced also by Riberi of the same city.

Vacca-Berlinghieri of Pisa, following the example of Giuntini and Angiolo Nannoni, used trephining in suppurative meningitis, and made valuable studies on crossed hemiplegia, warning against the theory advanced by Cassio Introsofista and approved by Valsalva.

Ranzi and Rizzoli gave capital advice on intervention in cases of intracranial effusions, naming the temporal region as the selective place for trephining.

In Siena, Zanobi Pecchioli trephined for a malignant tumor, Palasciano in Naples, successfully removed an echinococcus cyst from the encephalon; in Bologna, Rizzoli, with a trephine larger than ever used before, removed an old exostosis from trauma which was causing epilepsy. More audacious, Vanzetti removed a large tumor which had displaced the median lobe of the brain ("Observations d'un kyste osseux situé au côté droit de la tête, qui avait détruit la base du crâne sans

dérangement des fonctions du cerveau," Kharkoff-Paris, 1845), while Ferdinando Zannetti was publishing his large and valuable work, "La trapanazione del cranio dell'uomo riconfermata nelle practica dell'alta chirurgia operatoria."[1] The great anatomist, Prof. Carlo Giacomini of the University of Turin, published his very original work[2] inspired especially by the experiences of Broca and Ferrier, trying to give a correct connection between the cranium and encephalon, the rolandic zone and the central part of the cerebral hemisphere, which the surgical knife could reach with safety. This careful description of Giacomini has been a great help to the surgeons.

Following that line, Prof. Antonino D'Antona of Naples, published "La Nuova Chirurgia del Sistema Nervoso Centralc,"[3] giving a graphic account almost with mathematical precison.

Fabrizio Padula, likewise from Naples, in his "Chirurgia Cranica," takes up the subject of the rolandic line, which has been discussed with mutual advantage also by Prof. Giovanni Pascale, the present director of the surgical clinic of Naples, and by Prof. Michele Titone of the University of Palermo, since transferred to Pavia.

Another distinguished surgeon of Padua, Prof. Rodolfo Penzo, assistant of Bassini, describes a method somewhat different from the one of D'Antona, and which is highly ingenious.[4]

Cranial surgery in Italy has numerous followers,

[1] Prof. Ferdinando Zannetti, Prato, 1878.

[2] Topografia Della Scissura di Rolando, Torino, 1878.

[3] Napoli, 1893.

[4] Proposta di un nuovo metodo di ricerca del solco di Rolando. *Riforma Med.*, 1897, 15.

but the list is too long to enumerate in book form, or in reviews. Suffice it to mention the late Emilio Scafi.[1] Scafi suggests, in his publication, an original method for obtaining a large flap of bone, with two operations: one, for the purpose of resecting the bone, giving time for the wound of the scalp to heal; the second, for reverting the large flap, which following the operation, is sewed into place without loss of bone substance.

Also the following contributions:

Alessandro Codevilla: "Dei mezzi di riparazione delle scontinuita' craniche."[2]

Ercole Sacchi: "del modo di riparare le perdite di sostanza del cranio" and "Plastiche della dura madre;"[3] also "Contributo alla tecnica delle plastiche del cranio cd allo studio dei lobi prefrontali."[4]

Pietro Ferrari: "Obliterazione sperimentale dei seni della duramadre."[5]

G. F. Novaro: "Sulla chirurgia cerebrale."[6]

A. Murri: "La craniotomia esplorativa e la diagnosi dell' ascesso cerebrale cronico."[7]

D. Giordano: "trapanazione del cranio in seguito a ferite della arteria meningea media."[8]

A. Ceccherelli: "L'apertura delle cavita' nei casi di raccolte purulente."[9]

[1] Tecnica ed indicazioni delle reserzioni craniche (*Ext. Bull., Societa Lancisiana*).

[2] *Arcb. di Ortop.*, VIII, No. 6.

[3] *Riforma Med.*, August, 1893.

[4] *Riforma Med.*, February, 1894.

[5] *Arcb. per le Sc. Med.*, XII, No. 19.

[6] *Bull. d. Sc. Med.*, Bologna, 7 s., II, 1891.

[7] *Policlin.*, II, January 15, 1895.

[8] *Gazz. med. di Torino*, 1893, XLIII.

[9] *Med. contemp.*, VI, VII, 1885.

A. Nannotti: "Primo contributo sperimentalle sulla cura chirurgica delle meningiti."[1]

G. Gradenigo: "Sulla tecnica operativa dell' ascesso cerebrale ottico."[2]

Too much space would be required to give here the names of all the surgeons of Italy who have written upon cranial surgery. Something, however, must be said about the literature on the pituitary gland, and the work done in Italy on that subject, as for instance:

Ercole Sacchi: "L'acromegalia."[3]

G. Vassale ed Ercole Sacchi: "Sulla distruzione della ghiandola pituitaria."[4]

Tamburini: "Contributo alla patogenesi dell' acromegalia."[5]

Lodovico Isnardi: "Microcefalia e craniectomia."[6]

Carlo Giacomini: "I cervelli dei microcefali."[7]

D. Giordano: "La craniectomia nei microcefali, Rivista Critica."[8]

E. Morselli: "La cura chirurgica dell' idiotismo."[9]

Italian surgery has many remarkable publications upon trigeminal neuralgia, among them those by Baroni, Fumagalli, Inzani, Gherini, Luca Fattori, Galignani, Parravicini, Regnoli, Vanzetti, Vivante, Laurenzi, Gaetano Bernabeo, Tansini, Mugnai, G. F. Novaro, A. Caponotto, A. Salomoni, A. D'Antona, F. Spallitta, and

[1] *Policlin.*, Sezione chirurgica, 1895, 372.
[2] *Arch. ital. di Otol*, v, 1897.
[3] *Riv. veneta di sc. med.*, 1889.
[4] *Riv. sper. di freniat.*, XVIII, 1892 and XX, 1894.
[5] *Riv. sper. di freniat.*, 1895, and *Congr. internat. de méd.*, Bruxelles, 1897.
[6] *Gazz. d. osp.*, 1895.
[7] Torino, 1890.
[8] *Riv. med. di. sc. med.*, 1895, I, 89.
[9] *Gazz. d. osp.*, 1893.

Monari. Most of these surgeons tried to find the best way of reaching the gasserian ganglion, with the least disfiguration of the face.

Rhinoplasty is linked to the name of Tagliacozzi, although before him the art of correcting deformities of the nose was in vogue since the year 1440, particularly in the southern part of Italy, where the names of Branca, Boiani, Vianeo, Ronzano, Pavoni and Montigore were well known before Tagliacossi. There are numerous papers on the subject, one of them by Domenico de Luca, "Su Vianeo di Calabria, ed il Metodo Autoplastico Italiano"[1] may be noted. The names of Ruggieri Levi, Antonio Lunghi, Cortesi, Molinetti, Fioravanti, Carlizzi and Marzolo are recorded by Giordano who could now write some wonderful pages on the work in face reconstruction during the war, as well as on the subject of plastic surgery.

The literature and the practical contribution of Italy to the surgery of the tongue, of the tonsils and salivary glands, is both adequate and praiseworthy. Giordano narrates: the work of D. Biondi, "Contributo alla plastica endorale;"[2] Valerani, "Caso di macroglossia congenita, felicemente operato;"[3] Gallozzi, "Ipertrofia della lingua, escisione parziale, sutura, guarigione;"[4] A. Nota, "Della macroglossia in resoconto clinico dell' ospedaletto infantile;"[5] Vanzetti, "Occultus linguae abscessus oncotomia;"[6] Tizzoni and

[1] Napoli, 1858, Stamperia dell' Iride.
[2] *Clin. chir.*, 1897.
[3] *Gior. d. r. Accad. di med. di Torino*, 1876.
[4] Morgagni, 1872.
[5] Torino, 1894.
[6] *Ann. Clin.*, Charcoviensis, 1846.

Parona, "Contribuzione allo studio dei tumori rari per la loro sede;"[1] Remedi, "Resoconto clinico;"[2] G. Corradi, "Commentario, 1730;" G. Fiorani, "Nuovo processo per l'amputazione totale della lingua;"[3] Enrico Bottini, "La metodica amputazione della lingua dal cavo orale;"[4] Arturo Ortuani, "I diversi metodi di amputazione della lingua per epiteliona in confronto al metodo termogalvanico;"[5] E. Bottini' "Le prima centuria di amputazioni della lingua per carcinoma esequite colla dieresi termogalvanica;"[6] and Giorgio Regnoli preceded Billroth, Menzel, Kocher and Cloquet in the superhyoid method, as related by Ranzi.[7]

The technique of Regnoli was followed by Gianmattei of Lucca, also with good results.

Azzio Caselli: "Nuovo processo per l'amputazione della Lingua."[8]

Gustavo Usiglio: "Intorno a 10 casi operati di carcinoma della lingua."[9]

Durante, has a slight modification of the Regnoli method.[10]

The list grows in cases of operations on the tonsils and salivary glands. We find Larghi[11] of Vercelli advocat-

[1] *Ann di med.*, March, 1877.
[2] Siena, 1891, 23–25.
[3] *Ann. di med.*, 1882.
[4] Milan, 1874.
[5] *Clin. chir.*, 1897, Nos. 10 and 11.
[6] *Clin. chir.*, 1894.
[7] Nuovo metodo per l'estirpazione della lingua immaginato ed esequito dal Professore Giorgio Regnoli ed esposto dal Dott. Andrea Ranzi. Pisa, 1838.
[8] *Bull. d. sc. med.*, Bologna, 1874.
[9] *Riv. med. di sc. med.*, 1890.
[10] *Inst. chir. di Roma*, 1886, 33.
[11] *Gazz. med. ital. Prov. Sarde.*, 1861.

ing enucleation of the tonsils with the finger, with less danger of hemorrhage. Biondi used scissors in preference to the tonsillotome.[1] T. G. Rima wrote "Storia di un voluminoso tumore estirpato dal collo di Marianna Talenti."[2]

Vanzetti: "Extirpatio parotidis."[3]

G. B. Manfredini: "Estirpazione di due parotidi."[4]

Luigi Malagodi: "Sulla estirpazione della ghiandola parotide."[5]

Valuable contributions were also given by Colomiatti, Bertini, Caselli, Bidone and Dandolo.

The subject of the spinal column has been benefited by an extensive literature from the Italians. V. Cavagnis, antedating Quincke and Chipault, wrote on the technique of the sacrococcygeal puncture by means of the trocar, so as to draw off the pus in cases of meningitis (1878).

R. Muscatello, Parona, Ambrogio Gherini, Alessandri, Achille Boari, Mario Motta, A. Turretta, and Giuseppe Villani all contributed to spinal surgery.

In the total extirpation of the larynx the late Enrico Bottini, Giacomo Filippo Novaro, Giuseppe Ruggi, excelled although the literature from other eminent surgeons is quite large: Chiarella,[6] Caponotto,[7] A. Leonardi,[8] and C. Orecchia.[9]

[1] *Osp. di pat. e clin. chir.*, Bologna, 1892.
[2] Treviso, 1826.
[3] *Ann. clin.*, Charcov, 1846.
[4] Modena, 1824.
[5] Ippocratico di Fano, 3, s., XIX, 1871.
[6] *Arch. ital. di laringol.*, 1887, No. 4.
[7] *Gazz. d. clin.*, XIX.
[8] *Arch. ital. di laringol.*, 1894, No. 2.
[9] *Riforma med.*, 1892.

On the operation of the esophagus there is a very important publication by A. Vacca Berlinghieri: "Della esofagotomia e di un nuovo metodo di esequirla."[1] More recently articles have appeared by L. Ciartoso, "Sulle stenosi dell' esofago;"[2] by G. Galli,[3] who gives a special technique, and by G. F. Novaro.[4]

Thyroid gland surgery, as Pagello wrote in 1888, attracted many leading surgeons of Italy: Ruggi; Caselli; Marconi; Ceccherelli; Dionisio; Corradi; Bassini; Novaro; Tansini; Cacciopoli; Trombetta; and Bottini, each reporting many unusual cases at the sixth meeting of the "Società Italiana di Chirurgia." Eugenio Casati; Attilio Catterina; Francesco Golzi; Giusto Pagello; Martino Berardino; Gustavo Usiglio; Domenico Biondi; Annibale Salomoni; Ercole Sacchi; Giulio Vassale; and Ernesto Bozzi have also to their credit various studies on the thyroid and goiter, and the technique of the operation.

A case of Basedow's disease, successfully cured by strumectomy, is reported by Ripamonti, followed by one by Bottini, and one by Tricomi who resected both lobes.

Michele Troja was the first to devise a theory on bone reproduction in his "De novorum ossium in integris aut maximis" or "morbus disperditionibus regeneratione experimenta;"[5] and almost a century after, Bernardino Larghi of Vercelli was the first to put in practice Troja's ideas, "De l'extraction sous-périostée

[1] Pisa, 1820
[2] Torino, Baglione, 1885.
[3] *Gazz. med. di Tornio*, XXXIX, 1888.
[4] *Accad. med.*, February 11, 1891.
[5] Naples, 1775.

et de la reproduction des os; extraction sous périostée des côtés en particulier."[1]

Italian surgeons have been justly proud of Michele Troja and Bernardino Larghi, and of that pride they have given proof in excelling in bone surgery, especially in the last war.

Few modern surgeons perhaps know that the great Gabriele Falloppio in the middle of the sixteenth century, while professor at the University of Padua, had already determined that in the removal of the breast for cancer, not only all the mammary glands, but also the membranes and the small glands around, had to be carefully removed. This rule was followed by his pupil Fabricius ab Aquapendente, who realized intuitively the diffusion of the dreaded disease. This theory was scientifically confirmed by one of the greatest Italian pathologists, Vittorio Colomiatti, in 1874, in 'Contribuzione allo studio del cancro e del tubercolo e dell'istologia del gran simpatico."[2] The rules of Falloppio were followed by Angiolo Nannoni of Florence (1790), and by Giovanni Battista Palletta (1820), who warned his colleagues against leaving suspicious skin for the sake of a better flap. The contributions to the study of breast cancer and on operative technique are considerable in Italy, but the list would be too long to enumerate here.

Thoracic surgery had already, in the beginning of the last century, achieved success under Cittadini D' Arezzo,[3] who successfully resected the ribs with insufflation of air into the lung. The rapid progress made lately in

[1] *Gaz. med. de Par.*, June 5, 1847, 434.
[2] *Accad. di med.* di Torino, February 20, 1874.
[3] *Com. Alla Accademia Aretina del Petrarca*, January 31, 1813.

endothoracic surgery, thanks to the wonderful work of the lamented Carlo Forlanini and that of his successor, Eugenio Morelli, needs no illustration here, since their discoveries are well known to the American profession. It has revolutionized the therapy of thoracic diseases, as far as the respiratory organ is concerned, and changed, to a great extent, the surgical technique of pleural and lung operations.

Wounds of the heart, although rare, have been the subject of much discussion in Italian surgical literature. As early as 1642, Tarduccio Salvi da Macerata in a short treatise, "Il Chirurgo," defines wounds of the heart as fatal, although Falloppio and Valsalva, prior to that date, had described cases of recovery. Later on, Morgagni and Bianchi were decidedly optimistic while Simplicio del Vecchio[1] published a case of successful suture of the heart, as did also Parrozzani,[2] Ninni,[3] Errico Giordano;[4] Sironi, Cappello, Tassi, Longo, Ramoni, Arcangeli, Fummi and Tuzzi, all of whom reported similar cases of recovery.

Intervention in the mediastinum is more practically and successfully described by Marocco;[5] and Raffaele Bastianelli[6] reports a case of resection of the manubrium of the sternum, so as to remove a dermoid of the mediastinum. G. F. Novaro, as well as Errico Giordano, resected part of the sternum for tumor or abscesses of the mediastinum; likewise, Parona, Ruggi, and Cavazzani.

[1] *Riforma med.*, October, 1898.
[2] *Accad. med. di Roma*, June 27, 1897.
[3] *Accad. med. chir.*, Naples, August 14, 1898.
[4] *Riforma med.*, September 10, 1898.
[5] Torino, 1814.
[6] Societa Lancisiana, *Osp. di Roma*, March, 1893.

An important organ in thoracic surgery is the diaphragm, which Postempski of Rome opened through the thorax to reach the abdominal cavity.[1] Sodo,[2] in a case of gunshot wound piercing the thorax, diaphragm, spleen and kidney, removed the bullet through these organs with success.

Impallomeni, Amante, Rossini, Ninni, Bignardi, Curti, Sorrentino, Raimondi, Maragliano, and Corradi also operated for diaphragmatic wounds. The abdomen and abdominal surgery are treated at length in Davide Giordano's book, and would occupy more space had it been written after the war, instead of in 1911.

The questions of early intervention, method of dressing, and after-treatment have been extensively experimented with and discussed, and new conclusions have been drawn which have greatly changed the modern surgery of that branch, although extensive contributions already existed on the subject by Burci, Carlo Maglieri, F. Durante, Errico Giordano, Sorrentino, A. Nannotti, Gesualdo Clementi, F. Gullotta, G. Sorge, G. Turrazza, E. Ligniti, L. Bonomo and F. Rho, Luigi Amabile and Tommaso Vernicchi.

Giordano's book reviews the part taken by Italian surgeons in the art of sewing up the intestines, beginning with the original method of Nicola D'Apolito, of which a full description is given in the "Treatise of the Surgical Operations of Panzetta."[3] He enumerates the various modifications proposed, the Murphy button, and the

[1] Postempski anf Manara. *Soc. ital. chir. di Bologna*, April 16, 1889, and *Riforma med.*, 1890, I, 647.

[2] Ferita d'arna da fuoco del torace e dell'addome; splenectomia e nefrectomia, occlusione secondaria dell'intestino; secondo intervento, guarigione. *Riforma med.*, 1896, IV, 411.

[3] II, 269, Naples, 1867.

other original methods—those of Burci,[1] Morisani,[2] Parlavecchio,[3] Errico Giordano[4] and R. Marponi.[5]

In gastric surgery Giordano mentions first P. Loreta as an original pioneer.[6] G. F. Novaro,[7] A. Caponotto,[8] and Ancona, also Codivilla, Caporale, Panzeri, Falleroni, and Postempski all eulogize Loreta's method. In France, Jules Genevrier[9] reports 47 cases of permanent cures in 65 cases operated by Loreta's method.

After that follows a summary of the results of surgical invervention by pyloroplasty, well illustrated by Lodovico Corazza. In Giordano's note on 51 cases of pyloroplastic surgery, 22 of which belong to Italian surgeons, are: Novaro, 6; Postempski, 5; Carle, 3; Colzi, 3; Durante, 2; Falleroni, Ceccherelli and Corazza, one each. Novaro,[10] A. Ceccherelli,[11] F. Durante,[12] and A. Carle[13] have given accounts of the method.

[1] Sul saldamento della mucosa intestinale ravvicinata mediante sutura. *Cong. della soc. ital. di. chir.*, October, 1897.

[2] Uber einen neuen Operation Invaginationsprocess bei Geradlinigen Darmanastomosen, *Centralbl. f. chir.*, 1899.

[3] Nuovo metodo per le enteroanastomosi nell'asse, e laterali, per le gastro e le colecisto-enterostomie. II *Policlin.*, Sezione chirurgica, 1898, 180, 376, 429.

[4] *Gazz. internaz. di med. prat.*, January, February, 1899.

[5] Suture coefficienti ai progressi della chirurgia intestinal. *Clin. Chir.*, 1899, 30.

[6] La divulsione digitale del piloro e la divulsions strumentale del l'esofago e del cardias, invece della gastroctomia. *Mem. Lette. alla Accad. d. Ist. d. soc. Med. di Bologna*, Treves, 1884.

[7] Commemorarazione di Loretta, Bologna, 1892.

[8] *Regia Accad. di med. di Torino*, January, 1885.

[9] Thès. de Lyon, 1899.

[10] Contribuzione alla chirurgia dello stomaco, 1888, 14.

[11] Intervento chirurgico nelle malattie dello stomaco., *Confer. clin. ital.*, Milan, 1 s., II, No. 3, 1898.

[12] Considerazioni sui ristringimenti pilorici e loro cura. *Policlin.*, Roma, July 15, 1894.

[13] Contribuzione alla chirurgia dello stomaco. *Cong. Med. internaz.*, Roma, 1894; and Chirurgia vie digerenti., Cong. soc. di chir. *Riforma med.*, 1895, IV, 374.

Before gastroenterostomy was adopted in France it was already practiced by Novaro, Caponotto, Giordano, Anglesio in Turin, and by Postempski in Rome.

If the contribution of Italian surgeons to gastric surgery and to the surgery of the intestinal tract is large, still larger is that to the surgery of the liver, which starts from Fabricius ab Aquapendente and comes down to Fabio Vitali, Luigi Ferrarini, F. de Filippi, E. Bozzi, A. Caldarelli, Pietro Ferrari, Davide Giordano, Raffaele Bastianelli, Comandini, E. Salvolini, Luigi de Gaetano, Prospero Guidone, Mazzarini, Clementi, Micheli, J.B. Bianchi, Marchetti, Molinelli, M. G. Levi, Gaetano Paolucci, Ughetti, D. Biondi, Ciaramelli, A. Sgambati, Sergio Pansini, Raffaello Silvestrini, Enrico Burci, G. Usiglio, Giuseppe Beisone, Luigi Soave, Luigi Rieppi, Ghendini, E. Terrile, Antonio Leonardi, Guido Cavazzani, Giacinto Viola, Bindo de Vecchi, Rovighi, S. Castellani, F. Fiorioli, Della Lena, Achille Boari, Cimbali, V. Piazza and Martini, some of these surgeons dealing especially with abscesses and echinococcus of the liver.

In the field of hepatic calculus there are extensive and valuable contributions by Aristide Mattoli, A. Dandolo, B. Schiassi, Annibale Salomoni, Ciro Della Rosa, U. Monari, C. Pantaleoni, P. Grocco, L. Mazzotti, Giuseppe Jona, Canali, Griffini, Colucci, Petrone, Francesco Fiore, E. Matteo Giancola, Giulio Filippini, J. B. Segale and Luigi Baldassari; likewise to the literature on the pancreas, to which Filippi, Mazzoni, Dandolo, Vincenzo Giudiceandrea, Michele Titone, Giordano, Ruggi, Biondi, A. Mugnai, E. Tricomi and A. M. Luzzato have contributed.

Concerning the spleen, Giordano refers to Leonardo Fioravanti, who, in April, 1549, performed the extirpation of a vuluminous spleen successfully,[1] and follows with a long list of contributors: Massapust of Triest; Eriberto Aievoli; Bernardino Martino; Carlo Cangitano (reporting 39 cases of splenectomy with 13 deaths); Maffucci and Montenovesi; Angelo Pugliese; A. Ceci; Gaetano Bragagnolo; G. Tedeschi; Timoteo Valeggia; Carlo Mariani; A. Nannotti; A. Turretta; G. D'Urso; A. Raffa; F. Brancaccio and A. Solaro; A. Parona; Jemoli; A. Pizzorno; Aurelio Cordero; Guerra; E. Mercandino; Luigi Guida; Giovanni Cirillo and Giovanni Pirri.

Tubercular peritonitis has also been the subject of many contributions by B. Martino; L. Soave; Enrico D'Anna; Filiberto Casinari, and M. Jorfida who gathered 270 bibliographic notes on that subject.

The name of Edoardo Bassini is placed first on the list for the surgical treatment of inguinal hernia, as the exponent of a special method of operation well known throughout the world. The list is followed by many other well-known names: A. di Giacomo; D. Morisani; G. Cacciopoli; Rodolfo Canepa; Angelo Roth; Martino; Usiglio; Penzo; Ciro Della Rosa; P. Tansini; Giulio Filippini; Garampazzi; Postempski; A. Mugnai; Pietro Ferrari; Ruggi; Golzi; Galliani; Stecchi; Bonomo; Tricomi; Parlavecchio; Ferrari and Racco.

Gynecology is the field upon which Giordano dwells extensively as a part of surgery in which most of the leaders in general surgery participate—men like Bottini,

[1] Compendio di Tutta La Chirugia. Di Leonardo Fioravanti, Bolognese. Venice, MDCLXXVII, 364.

Paci, Bompiani, Caselli, Bellini, Peruzzi, Novaro, Ruggi, Berruti, Bergesio, with an extensive nomenclature of cases, original methods, and modifications of well-known methods of national and foreign origin. He mentions an old treatise of Giovanni Marinelli—"Le medicine pertinenti alle infermità delle donne,"[1] reviewing down to the present time the important works of: Ruggi; Caponotto; Peruzzi; Turrazza; Morisani; Pestalozza; Della Rosa; De Cristoforis; Casati; Libero Bergesio; Porro; Bompiani; Frattina; Velo; Calderini; Acconci; Inverardi; Truzzi, and Mangiagalli, the illustrious organizer of the Scientific Institute of Milan.

Urology also offers a large field to Italian surgeons, in which they have produced abundant material on the surgery of the kidney, the ureter, the bladder, the urethra, and the connecting organs. An important publication by the author of the book, Davide Giordano,[2] gives an outline of the progress made at that time; and two others, one by Ceccherelli[3] and one by Carmelo Bruni[4] tell of what has been done in Italy on urology. Beside the surgeons above mentioned, many others wrote and specialized in that branch: Nicola Giannattasio; Francesco Mastrosimone; Italo Antonelli; L. Sottocasa; Cesare Zatti; Dario Maragliano; Alessandro Cantieri; A. Michelazzi; Augusto Luxardo; Francesco Fabris; Giulio Anzillotti; Ermanno Fioretti; A. Rovighi; Paolo Fiori; Giuseppe Del Fabro; Baldo Rossi; Erasmo de Paoli; G. Pesenti; Pietro Pozza; Ugo

[1] Venice, De Franceschi Senese, 1563, 174–178.

[2] Chirurgia renale. Torino, Unione Tipografica, 1898.

[3] Progressi recenti nella patologia e terapia degli organi genito urinari; Imparziale Anno 23.

[4] Gli Italiani e i progressi recenti nella chirurgia delle vie urinarie.

Pisani; Fernando Franzolini; Luigi Ferria; Corradi; A. Tommasini Degna; Giusto Pagello; Giuseppe Paccinotti; Annibale Nota and G. Dalle Ore.

The male genital organs are subject to so many diseases that the nomenclature of each would fill many pages. Phimosis, epididymitis, orchitis, hydrocele, varicocele and their varieties, tuberculosis of the testis in its different forms, from Guglielmo Da Saliceto to the present day, have been subject to so many modifications as to the different methods of treatment, that perhaps modern surgery has become more conservative. Nicolo Trevisan, Oscar Bardella, Mario Fasano, Alberto Marrassini, G. Pascale, A. Poggi, Ingianni, Arpini, D'Urso, E. Torcello, A. Ferraro, Mario Donati, M. Belli, O. Schifone, Filippo Carta, Giorgio Paci, Carlo Viscontini, Giuseppe Bennassi, Enrico Nespoli, Dante Boni, C. Parrini, Giovanni Melchiori, Silvio Rolandi and Pasquale Landi are all authors of interesting studies and statistics of operations performed.

The surgery of the anus and rectum has made great progress, in the method of treatment, at the hands of Italian surgeons, among whom Giardano's book mentions Cittadini D'Arezzo,[1] Angiolo Filippi,[2] G. Mioni,[3] Giuseppe Flajani,[4] Antonino Virdia,[5] Francesco Reali, Giuseppe Cavallini,[6] D. Fieschi[7] and Vincenzo Meirocco.[8]

[1] *Dix. Clin.*, XXIX.
[2] *Sperimentale*, 1869.
[3] *Gazz. d. osp.* No. 152, 1905..
[4] Collezione di osservanzioni e riflessioni, Roma, 1803.
[5] Chirurgia rettale, anale, Napoli, 1900.
[6] Firenze, 1762.
[7] Isolamento del retto, 1908.
[8] Trattamento emorroidi interne. *Gazz. med. di Torino*, 1885.

In the final review of his book, Giordano deals with the surgery of the lower limbs and again refers to that great teacher and operator, Bernardino Larghi, who has contributed so largely to general surgery (Incisione unica, ossia nuovo metodo per la rescissione della testa del femore e per la disarticolazione della coscia dal bacino.[1] In his book[2] Giordano notes his successful case with illustrations, then proceeds to demonstrate what other surgeons did in hip diseases and operations.

He mentions Remigio Stecchi[3] and Alessandro Codivilla,[4] and, on the same subject, Gaetano Tarchetti,[5] who, dividing his work into regions, reports, in discussing the knee, Vanzetti's resection in 1865 (that is in an epoch prior to Lister) in which Tarchetti used creosote dressing, as did also Franzolini, injecting a concentrated solution of carbolic acid. Extensive and valuable contributions have been recorded by G. F. Novaro, Erasmo de Paoli, Andrea Ceccherelli (1883), Azzio Caselli,[6] Ciro Della Rosa,[7] F. Durante,[8] Poggi[9] and Alberto Finelli.[10]

Giving special mention to Larghi, who preceded Obalinski in the resection of the tarsus, Giordano

[1] *Gior. d. Accad. di med.*, Torino, 1855.

[2] I'Artrectomia dell'anca e cura della coxite. *Clin. chir.*, 1898, No. 9.

[3] Sulla coxite tubercolare, contribuzione alla cura col metodo Giordana. Supplemento *Policlin.*, 1901.

[4] Trattamento lussazioni traumatiche inveterate dell'anca dell'adulto, *Arch. di ortop.*, 1902.

[5] Venezia, 1904.

[6] Sulle resezioni, collezioni letture, No. 8, August, 1881.

[7] Sessanta casi di chirurgia del ginocchio. *Riv. med. di Venezia*, 1898.

[8] Nuovo processo operativo per la resezione del ginocchio. *Bull. Accad. di Roma*, 1886.

[9] Resezione del ginocchio. *Cong. di Pavia*, 1887.

[10] Nuovo processo artrotomia del ginocchio, Napoli, 1902.

reviews the work of Gritti, Rocco, Giuseppe Cacciop-poli, E. Albanese, A. Caselli, and Angelo Negretto, who treated the subject from a broad original aspect.

On clubfoot surgery Giordano quotes Mario Motta of Turin,[1] Davide Giordano,[2] Giuseppe Frattin (Plastica Ortopedica),[3] C. Ghillini,[4] Pietro Cavatorti,[5] and Fedele Margary.[6]

Reviewing the progress of surgery in the interven-tion in nervous lesions of the lower limbs, following principally upon infantile paralysis, Giordano mentions G. Cacciopoli, Cappelli, Rossi and Salaghi, in their contribution to the treatment of paralytic feet in children,[7] and devotes special mention to A. Codivilla,[8] Lorenzo Cappelli,[9] and Baldo Rossi,[10]

Giordano closes with an article on varicose veins, summarizing the method of Pietro E. Lodovico Rostini,[11] and those of Cels,[12] Della Croce,[13] A. Tiraboschi,[14] L.

[1] *Polyclin.*, 1890.

[2] Piedi equini vari altissimo grado correzione con resezione, etc. *Arch. di ortop.*, 1889.

[3] *Riv. sc. med.*, Venezia, 1910.

[4] Trattamento piede torto. *Bull. soc. med.*, Bologna, 1903.

[5] I, piedi torti, studio anatomico clinco. *Arch. internat. de chir.*, 1904.

[6] Estirpazione Astragalo, 1886.

[7] *Riv. crit. di clin. med.*, XVIII, No. 8, 1917.

[8] I' trattamento chirurgico della paralisi infantile spinale. *Policlin.*, VII Sezione chirurgica, 1900.

[9] Trapianto tendineo nella cura di un caso di paralisi da poliomielite anteriore acuta—qualche considerazione sull'argomento. *Policlin.* Sezione practica, 1902.

[10] I Trapianti tendinei nella practica chirurgica. Milan, Tipografia Guidetti e Mondini, 1904.

[11] Compendio di Tutta la Chirurgia. Venezia, 1677, 128.

[12] Lib. VII, Cap. XXII, De Varicum Curatione.

[13] Lib. IV., Delle Piaghe, Cap. LXVII, Delle varici e della cura loro.

[14] Psicosi la cicatrizzazione di annosa ulcera wella gamba. *Risveglio med. d'Abruzzo*, December 20, 1909.

Rebaudi,[1] G. B. Palletta,[2] Tommaso Rima,[3] T, Volpi,[4] Raffaele Cecca,[5] B. Schiassi[6] and A. Moreschi.[7]

Finally, Giordano, with "un nuovo metodo piu semplice di curare le lesioni varicose delle gambe, secondo il concetto di Moreschi,"[8] closes his big and important volume (Compendio Di Chirurgia Operativa Italiana), leaving in the mind of every Italian surgeon the hope that he will soon publish an appendix dealing in the great work done by Italian surgeons during the Great War.

[1] Dell'obliterazione delle vene come mezzo curativo delle varici. *Arch. gen. di med.*, Maggio, 1833.

[2] Considerazioni sopra le varici. *Diz. clin.* XLVIII, 659.

[3] Sulla causa prossima delle varici alle estremita inferiori e sulla loro cura radicale. Venezia, Presso Antonelli, 1838.

[4] Delle cura radicativa delle varici alle gambe. *Di. clin.* CLVIII, 609.

[5] Nuovo metodo operativo per la cura delle varici. *Bull. d. sc. med.*, Bologna, 1906, VI.

[6] La cure des varices du membre inferieur par l' injection intraveineuse d'un solution d'iode. *Semaine méd.*, December 16, 1908.

[7] Il mio processo per la cura delle varici ed ulceri varicose gli arti inferiori *Riforma med.*, 1894, No. 48; *Clin. Chir.*, No. 2., 1899.

[8] *Gazz. d. osp.*, No. 151, 1899.

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